# THE SHIP HER STORY

W. CLARK RVSSELL

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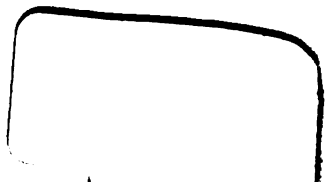

# THE SHIP: HER STORY

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## HER STORY

BY

W. CLARK RUSSELL

AUTHOR OF
'THE WRECK OF THE "GROSVENOR"'
'ALONE ON A WIDE, WIDE SEA'
'MY SHIPMATE LOUISE' ETC.

WITH 50 ILLUSTRATIONS BY H. C. SEPPINGS WRIGHT

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# PREFACE

I BEG to thank the Proprietor of the *Pall Mall Magazine* for his very kind permission to me to republish this volume of gossip about Ships. But the reader is under a very much greater obligation to him than this, because he has been good enough to allow the publishers to use the beautiful, and in many respects faultless, illustrations by my friend Mr. Seppings Wright. I am sure the reader will agree with me that some of these drawings are worthy the incomparable pencil of E. W. Cooke. My pages will not be accepted as a very learned and gravely important contribution to the literature of the Ship. They will be regarded as mere prattle, as we wander about the ship-building yard. We relate anecdotes; we crack our poor joke; we point to this and point to that; we tell what we know and what we believe to be the truth, and if we are wrong we apologise. Thackeray relates a good deal about the Four Georges in his Lectures; but he does not wear, whilst he talks to us, the judge's wig of the Muse of History: he is not so austerely official as Gibbon, but he is quite as sincere, and

possibly more interesting to an Englishman. At the same time, it is, perhaps, due to myself to say that this book is the issue of considerable reading and of my life-long admiration of that most beautiful and sentient expression of the handiwork of man—the sailing-ship. This said, I will leave the reader to enjoy Mr. Seppings Wright's delightful pictures.

W. C. R.

BATH : 1899.

# ILLUSTRATIONS

# THE SHIP: HER STORY

## I

THE story of the birth of the ship, her launch, her growth from the 'dug-out' to a P. & O. steamer or an armour-clad ship-of-war, should prove of interest to the people of this kingdom. If not to them, to whom? To the Chinese? To the merry families of the Tonga Islands? The floating mercantile property of this wonderful kingdom is valued at many millions sterling, [1] and the annual naval expenditure in defence of it and the docks and ports out of which it sails, adds many more millions to these figures.

One needs to be born a Chancellor of the Exchequer to realise the value, the meaning, the *numerosity* of all these millions. Yet one thing is certain—they must render the ship a fabric of grave interest to the people who spend all this money in building her and keeping her afloat and protecting her.

Built in th' eclipse and rigg'd with curses dark.

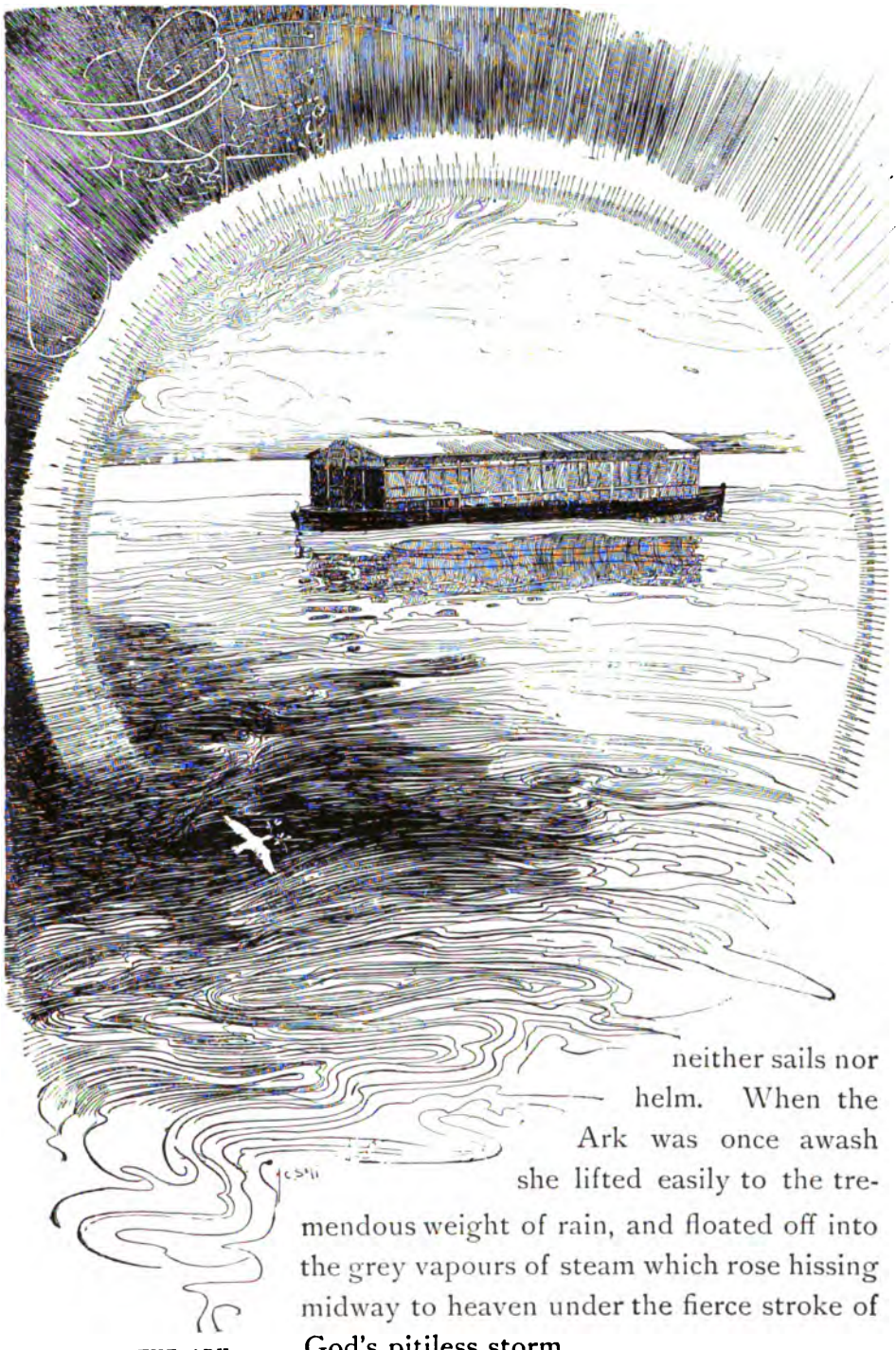
That some first ship was built in the eclipse of time none need question, and that she was rigged with curses dark is conclusively proved by the traditionary language of the fo'c'sle. But when was she built? What shape did the experience of the ship-wright give her? We speak with careless conviction of the Ark as the first ship, and of Noah as the first sea commander. But history, as an endless series of reassertions,

[1] These articles were written in 1895.

pronounces in terms disastrous to the reputation of Noah as a seafarer, in favour of the opinion that in times which make Abraham as of yesterday the oceans of the world were whitened with ships—stately, magnificent in device, equipped with engines of war more terrible than anything which the brains of Krupp or Armstrong, who labour in the heroic art of teaching how to kill, have yet devised.

Who is to tell us that millions of years ago great fleets of ships of extraordinary construction were not grappling in the airy blue? Human vanity is gratified by the retrospective gaze that cannot possibly pierce beyond the narrow horizon of time. We want everything to-day to be better than it was yesterday. The merits of the past moulder, and we, still calling ourselves heirs of all the ages, watch the process with ungrudging eyes. Still, it is rather comforting, all the same, to find the grand old Ark sweeping into the field of the lenses of the telescope, which had otherwise in vain searched the ocean of years for a relic of floating timber!

The Ark is the first ship, then, to human sympathy. Let her be called the Mother of Ships. Though we need not too curiously consider her, it is a strange fact, nevertheless, that the dimensions of this ship (taking the cubit at about eighteen inches) correspond very nearly with the proportions of a steamer of to-day. Her burthen was fifteen thousand tons. The 'Great Eastern' was seven thousand tons larger than the Ark. Noah, when he laid his keel, designed with strict reference to the animals and to the living sheets of water that were to descend from the heavens. He would have needed to build with great caution, nevertheless, for unless the animals were stalled a sudden panic amongst them would occasion a dangerous 'list.' Noah seems to have provided against this by building his extraordinary stables upon a gigantic spoon-shaped hull. He required



THE ARK

neither sails nor helm. When the Ark was once awash she lifted easily to the tremendous weight of rain, and floated off into the grey vapours of steam which rose hissing midway to heaven under the fierce stroke of God's pitiless storm.

Sir Thomas Browne, a genius of gloriously quaint imaginations, who saw things, as Coleridge puts it, by the light of the halo of genius that shone about his head, wonders whether Noah might not have been the first man that compassed the globe; 'since,' says he, 'if the Flood covered the whole earth, and no lands appeared to hinder the current, Noah must be carried with the wind and current according to the sun, and so in the space of the Deluge might even make the tour of the globe. And since, if there were no continent of America, and all that tract sea, a ship setting out from Africa without other help would at last fall upon some part of India or China.'

The circumnavigation of the globe in a hundred and fifty days would be a smarter piece of drifting than we are likely to hear of in this age. But nothing is impossible and nothing improbable at sea, Lord Nelson used to say. Yet conjectures can be pushed too far, even by elderly philosophers who read by the light of nimbuses. The Ark was undoubtedly, as our artist has represented her, a huge shed or floating stables; and after she had stranded on Mount Ararat and lay mouldering there, and when the waters had drained off the face of the land, the art of shipbuilding—whatever might have been its state *before* the Flood—was to be begun afresh, without any models to help and with no memories which could be called serviceable to inspire.

Perhaps man was not in a very great hurry to put to sea after the Flood. Time rolled on; humanity stuck to the land: it glanced askant at the water, salt or fresh. Everything then grows visionary and dim, and nothing comes along but the idea of a coloured man of an Asiatic cast of features stealthily and nervously sculling a hollow log, or holding on with the tenacity of a first voyager to the blown-out skin of some slaughtered beast.

Whilst voyages were performed by coasting from headland

to headland, small vessels sufficed. According to Theodosius the Homeric vessels were open boats. They were flat-floored, and were apparently clincher-built, and were caulked with pounded sea shells mingled with stuffs which gave a putty-like consistency to the whole. This caulking fell out when the vessel strained, but the ancients took care to carry balers along with them when they went afloat, and then again the land was always kept conveniently close aboard.

The art of caulking is extremely ancient, and was as lively a source of trouble to the mariner of remote ages as the sheathing of wooden ships was to the shipwright of the last century. The ancients, however, by caulking, prove that they made their vessels in pieces. They used pitch and wax and pounded seeds. It is an extraordinary fact that the galley of Trajan referred to by John Locke, in his 'History of Navigation,' was not only caulked but sheathed. 'None can doubt,' says Locke, 'that the sheet of lead nailed over the outside with copper nails was sheathing, and that in great perfection.' They had this art about eighteen hundred years ago. It was recovered when a galley of Trajan's time was found at the bottom of Lake Riccio; and the hint was taken in this country, and lead was used for sheathing British merchant ships many years earlier than 1673, in which year an order was issued by the Lord High Admiral to sheathe some of the ships of war with lead. It is worth noticing here that, though a few ships were thus sheathed, the practice was soon afterwards discontinued at the instance of Sir John Narborough, whose hostility to this dead weight was supported by many sea officers.

There were almost as many different sorts of ships in ancient times as there are in this age. We speak, for example, of the full-rigged ship, the barque, the brig, the schooner, and so forth. Our artist submits a noble example of the trireme. They had

the *gaulos*, a lumpish craft for freight; the *olkas*, a barge for towing; *corbita*, ships which carried canvas and baskets at their mast-heads. Some of these old craft came down, slightly modified and perhaps enlarged, and no doubt improved, into the Middle Ages, and even into later times, and were called galleons, and galeases, and galleys. Those old craft of bulky structure, and sides and bottom rounded from the flat, were gloriously decorated. A purple sail blew the Admiral's ship along. They painted eyes on their bows, after the manner of the Chinese of to-day. They had figure-heads, as our ships of wood had. Indeed, it is hard to imagine a ship without a figure-head. Sometimes they erected busts of gods and goddesses on what may safely be called their 'prows'; mainly they went to the forest and the field for devices for their curved and lofty stem-heads. As in modern times—that is, as late as the days of the Spaniards of Frobisher's and Hawkins's time—so anciently, the ship's company were divided into two classes; they had mariners for the sails, and men who were usually slaves for the sweeps or long oars. They sometimes pulled to the music of the pipe, more often to the crack of the lash.

One of the earliest of the boats of the Briton is the *coracle*. If we float her side by side in imagination with the latest launched of our battle-ships, we shall discover why her appeal to us should be direct and eloquent. The Briton was quietly fishing in her when galleys of burden were afloat, and the waters of the Mediterranean were being painted by sails of crimson and other dyes. Cæsar notices the coracle: 'The fishermen on the Tewi and some of the other rivers of Wales use a boat of singular construction, called in Welsh *corwgl*, which is probably coeval with the earliest population of the island.' The form of the boat was nearly oval; its length was from five to six feet, its breadth four feet. The frame was formed of split rods

A TRIREME

plaited; these were sheathed with raw hides. The boat was so light that it was easily carried on the back. Those were the days when 'wild in woods the painted Briton ran,' and some who ran had boats on their heads. Such a runner, thus equipped and delicately painted with the juices of his native soil, might fitly, in the hands of a dexterous and poetic framer of symbols, be made to typify the birth of the British Navy.

The state of shipping, however, in Britain in the days of the coracle was melancholy. The shipowner of that day was satisfied with small profits. We meet with movement and life by going abroad again. Take St. Paul's ship, for example. She was a Mediterranean merchantman, and stands as a type. There were no foreign departments in any way representing the Board of Trade in those days of the dawn of Christianity; dock dues may be of modern growth, but one may not say that the ancient skipper was not often enraged by excessive port and harbour charges. Yet, if such were, they yield us no clue to the burthen of ships in tonnage. 'It is remarkable,' says W. S. Lindsay, 'that while we have many notices of matters comparatively unimportant, no writer of antiquity has given us any intelligible account of the capacity of their ships of burthen, at least anterior to the Christian era.'

This worthy historian of the commercial flag of Great Britain quotes with approbation from a treatise on the voyage and shipwreck of St. Paul, written by 'Mr. Smith of Jordan Hill.' Mr. Smith tested as a yatchtsman the details furnished by St. Luke. He also worked out the 'dead reckoning' of St. Paul's ship. He affirms that she was a vessel of no mean burthen, since, irrespective of a large load of grain, she carried 226 people. Mr. Smith seems not to doubt that she was decked: her voyage was a long one, and, as it happened, a boisterous one; the seas that ran must have foundered any

open fabric, though of twice the bulk of St. Paul's ship. It is presumed, indeed, judging from the number of her passengers, that she carried two decks, likewise a high poop and forecastle, and her bulwarks were framed of battens secured horizontally across the stanchions. It is worth noticing that Mr. Smith concludes, from a painting he saw at Herculaneum, that the ancient sailors were acquainted with the use of the capstan and the hawser.

Here and there, in reading of the early ship, one meets with statements which must astonish a seaman. We all know from Homer that the anchor was a stone secured by ropes to the bow. An undecked craft light as a Madras surf-boat would, no doubt, ride safely thus moored in smooth water. As the world grew older an anchor superior to stones was devised. Pliny ascribes the invention of the anchor to the Tuscans. Strabo is the authority for the statement that the second fluke was added by Anacharsis the Scythian. Ships, as in our times, went to sea with several anchors. St. Paul's ship carried four, and in the gale they let 'them' go by the stern, which may have saved the life of the ship, for had she bowed the seas then running there is good reason to suppose, from the character of her shape forward and the appearance of her amidship section (which painters represent as a dangerous well-deck), that she would have gone down.

The sailor will be surprised to hear that those early Jacks went to sea equipped not only with chain cables but with anchor-buoys in the form of great cork floats. Though for a long period, running maybe into centuries, the rig of the ancient ship was of the simplest kind—namely, a large square sail, and occasionally a sort of mizzen—yet in some respects the hulls of vessels of burden, such as the grain-carrying craft, were equipped according to modern notions. We read of the ship

of Theseus as being completely decked and furnished with a little skylight. Whether the growth of shipping was retarded by the seaman's very imperfect and dangerous art of navigation, or whether it was arrested by lack of all impulse, by absence of all ambition to look abroad and observe if the earth was larger than the little piece of Europe with which the ancients were acquainted, may be left to the 'nautical experts' to settle. No doubt the ancient seaman was very poorly equipped with the means of finding his way about the sea when out of sight of land. He had the gnomon, with which he measured the length of the ship's shadow at noon. Other instruments—probably the lead and quite likely the reel log—he may have had, to judge of the account given by Arrian of his shipwreck. But the ship grew with the expansion of man's ambition and the increase of his needs.

Ships of considerable bulk were employed by the Romans in the grain trade between Alexandria and the rest of Egypt. Their character may be to a certain degree determined by the picture of the ship of St. Paul. It is to be assumed, however, that the navigation was largely dependent on their oars. It is impossible to suppose that vessels rigged as they were could ply, or, to use the modern expression, beat to windward. They might haul flat aft the sheet of their mainsail; but nothing, one would think could coax a craft with a stern like a castle and a bow literally like a moated grange, into looking up to within nine points of the breeze. The lee sweeps did the business of the bowline, and the curious structure was washed along by the rowers.

Probably one of the oldest types of ships is the Chinese junk of to-day. A representation of an ancient Chinese merchant vessel exhibits a structure that might very well be afloat off Hong Kong at the present hour. Perhaps shipbuilding

has to this day languished in China owing to the Chinaman's inability to grasp a few elementary geographical facts. For centuries John considered the whole earth as one flat surface: in the midst of this vast marsh or face of country stood China. It was the Empire of the Middle. If the Chinese mariner sailed but a little distance away from the Coast of Flowers he was certain to come to the edge of the earth and fall overboard, his junk, his wife, his children and all, down the horrible abrupt into an unimaginable chaos.

It is not to China, nor to her history, that we must look for anything useful, interesting or romantic in the story of shipbuilding. It is worthy of notice, however, that some of the small boats in use amongst the Chinese for river and short coast traffic very closely resemble the ancient boats of Britain. They are described as consisting of five planks only; these planks are bent by heat, shaped at either end, and the edges secured with wooden pins or with flexible thread of split bamboos. China has now her ironclads; but the junk and the coracle-like *paro* remain the philosophy and the sentiment of her navigation and her politics.

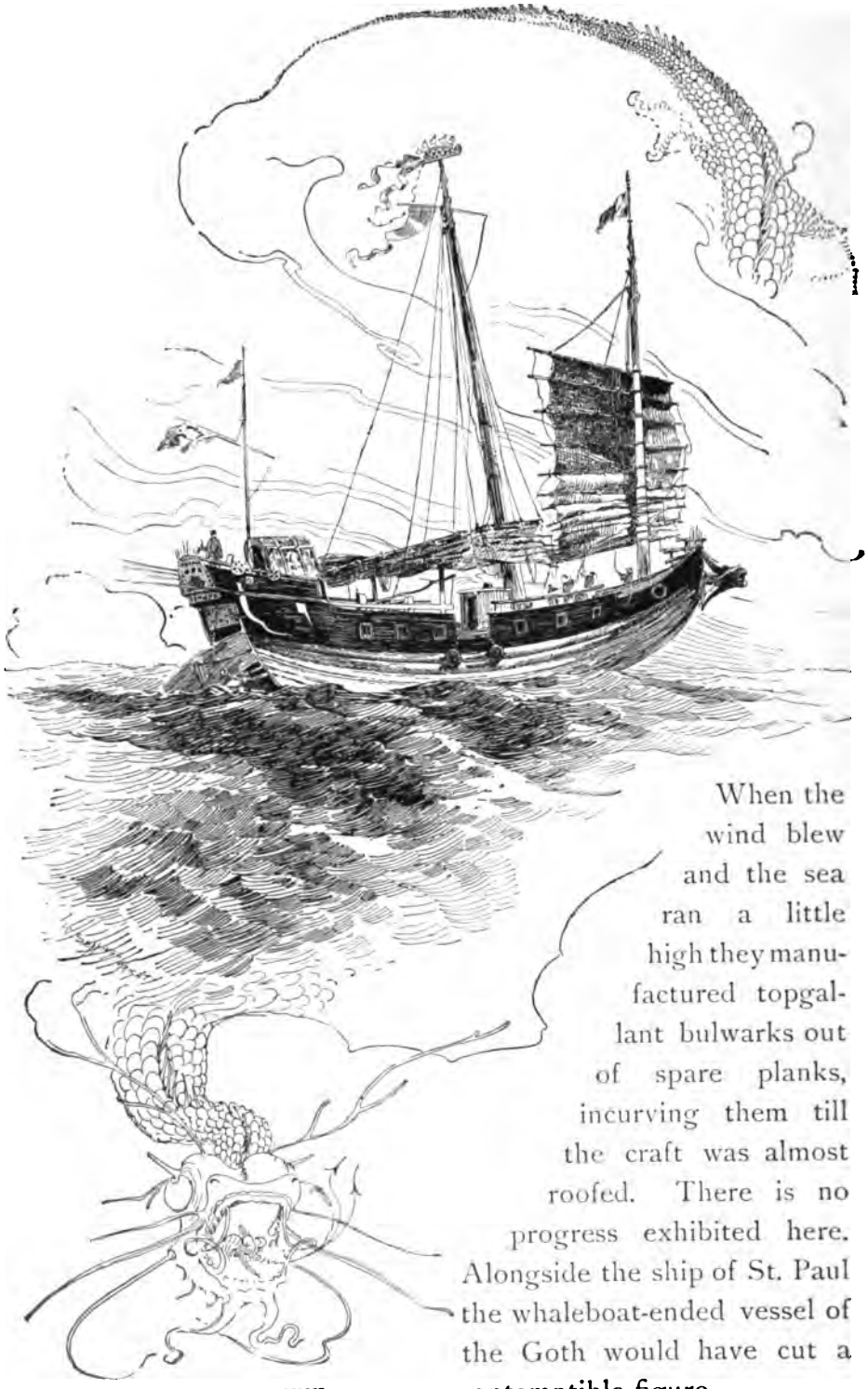
Nearchus was despatched by Alexander, the Macedonian conqueror, with the greater portion of his fleet, to the Euphrates, whilst the monarch proceeded with a large body of his army by land to Susa and Babylon. One would wish to know the size and character of the ships of Nearchus. No idea can be formed of them beyond this: that they were much too small to boldly put to sea; they sailed or rowed by day, and came to an anchor by night. They contrived, however, to measure sometimes as much as eighty miles in hours of daylight; but the average run seldom exceeded twenty-five—a progress of some two and a half to three miles an hour. We can only suppose that these vessels, together with a great many others then afloat belonging to other nations, were much of that

ST. PAUL'S SHIP

sort of galley which our artist has represented. They were deep-waisted, but then they carried high sterns and a kind of castle in the bows, so that forward and aft, if not amidships, they provided the officers and everybody in the ship, save the unhappy wretches slaving at the sweeps, with plenty of free-board. Those ancients, like the mariners of mediæval times, did not love salt water. They strutted dry on the height of a forty-foot 'dip.' The ocean looked to roll as far below them as it does to a young apprentice of to-day grappling with the mizzen-topgallant sail of an iron-clipper.

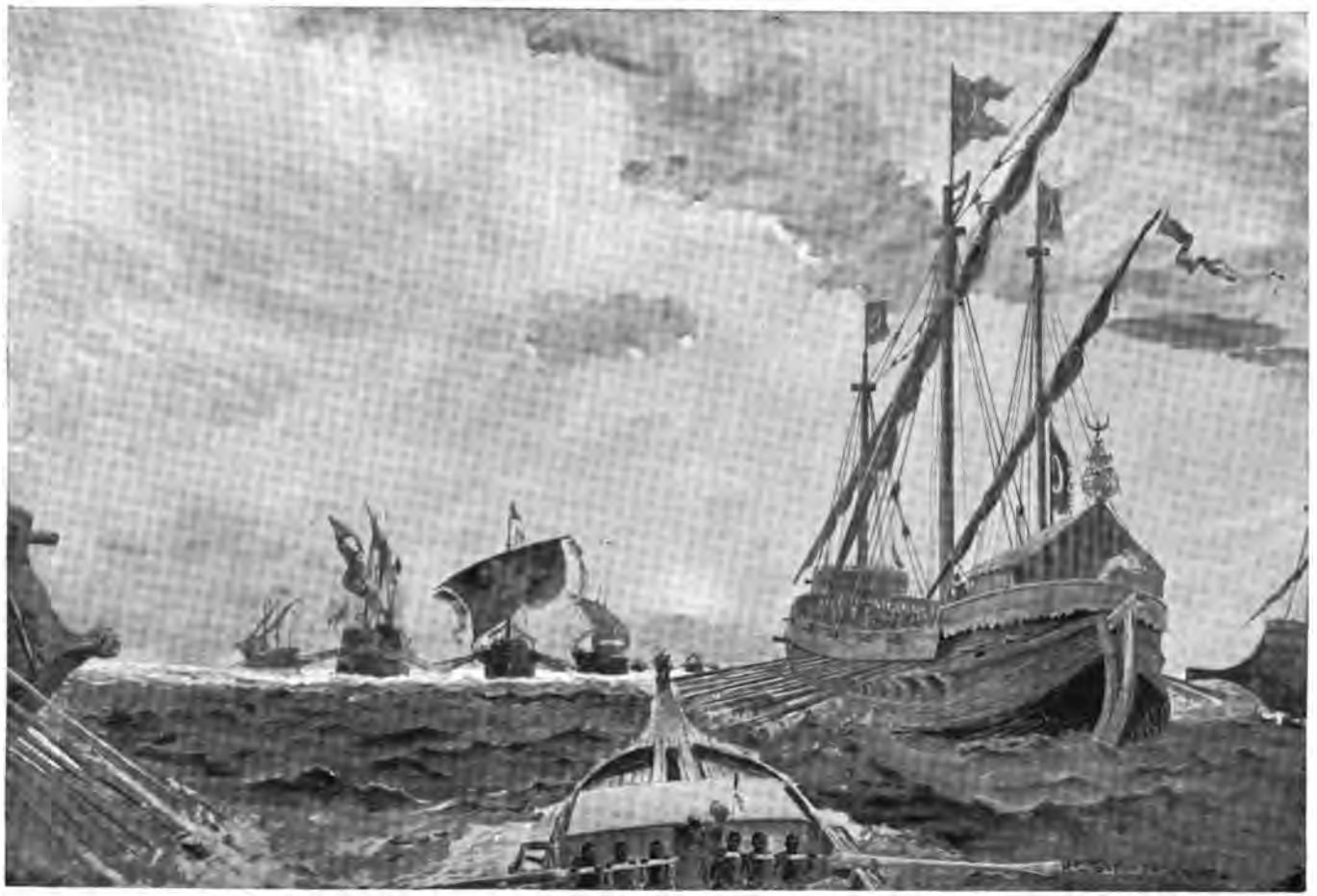
There was a great deal of trafficking with Ceylon in olden days, and we read that the merchants of that island had a numerous fleet of their own. What sort of ships these were it is impossible to say. Some have supposed the bigger ones amongst them to resemble those fine Turkish galleys of which our artist gives an example. It is not to be conjectured, however, that these Singhalese craft carried the bravery and the glory which were heaped in devices upon the war galley of the Turk until she shone like a ray of sunshine on the sea. The Ceylon boats of to-day suggest no native progenitors. What they were in the sixth century remains that century's secret. Their craft of to-day are built upon the models of other nations; the idea of their canoes is stolen from the islanders of the Eastern Archipelago, and their *ballams* are borrowed or copied from the vessels of Malabar.

Indeed, on this side of the Flood down to the times of the Portuguese caravels and the Spanish galleons, one finds little to interest, little indeed to comprehend, in the story of shipbuilding. It is not interesting to learn that the vessels in which the Goths made war, cruising here and there, and landing their savage forces as they listed, had narrow sides and broad bottoms, and were joined together without fastenings of brass and iron.



A CHINESE JUNK

When the wind blew and the sea ran a little high they manufactured topgallant bulwarks out of spare planks, incurving them till the craft was almost roofed. There is no progress exhibited here. Alongside the ship of St. Paul the whaleboat-ended vessel of the Goth would have cut a contemptible figure.



TURKISH GALLEY AT THE BATTLE OF LEPANTO

There are two ways of looking at a ship: the historian's and the shipwright's. Gibbon, for example, speaks of the 'curious and minute detail of the armament which was prepared for the reduction of Crete'; but this minute detail consists only of the number of the galleys employed, though indeed reference is

A SHIP OF TYRE

made to seventy-five vessels of the Pamphylian style. One can learn nothing from this sort of minute detail. One wants to hear the shipwright speak. Of what timber were those galleys built? By what machinery were they steered? How were the

people berthed? Did they lie under shelter, or did they stretch their limbs along the thwarts, or lie in the bottom of the boats? Possibly the descriptions of the uniremes, biremes, triremes, and so forth, may stand as likenesses of the craft of later ages. If so, then once for all we shall think of a war galley, with her stem and stern built high above her deck. Under a highly ornamented canopy is the image of the tutelar deity of the boat. She carries a flagstaff and hoists signals on it. She might carry a lantern on her stern. Her short mast is surmounted with a military top, whence the combatants let fly their darts and arrows. Her oars vary according to her burthen: we read of oars of from fourteen to fifty-seven feet long. That the galleys of the Romans and the ancient Greeks may be accepted as types which succeeding ages renewed or repeated with but small modification is proved by the resemblance of those ancient craft to the galleys of the Venetians and the Genoese.

But I pass from these old galleys to more romantic expressions of the shipbuilding yard.

## II.

THERE is nothing less intrinsically beautiful than a ship of the days of Da Gama, or of Columbus, or, later still, of Raleigh; yet there was no sort of water-borne fabric built so charged with the peculiar poetry of the sea and that kind of heightened quality of the grotesque which by moonlight or at a distance by day comes very near to beauty. We could not possibly manufacture the 'Flying Dutchman' out of anything launched this century. Think of a four-masted ship, with her dreary black-and-red hull, her iron masts, her metal shrouds, her short poop or long flush-deck, her bewildering complication of double yards—think of such a ship luminous with the sea-glow, breasting the surge of the Cape. *Accurst!* Impossible! She never could make a 'Flying Dutchman' in the spiritual meaning of that terrific sentence of doom. Vanderdecken would refuse command. He would jump overboard in his great boots, clutching his yard of pipe to his heart, and so would end one of the most poetical legends in all sea literature.

No; the phantom could not survive such a shock. The four-master in taking her place would, with thundering canvas, thrash the memory of her out of the seaman's mind. But in that seventeenth-century craft in which the profane and stubborn Dutchman put to sea he is still to be encountered. Doubt it not. Nothing to the north of 34° south; but down there, on soft, misty, moonlit nights, the spectre glides into being; the vision shapes itself into a fabric of stair-like poop, and a tall,

pale man, with a long, white, rippling beard, standing beside the helm, 'all silent and all damned,' as Wordsworth says; or she flies past over mountainous seas, leaps, as it were, out of some sudden shriek of storm and wool-white squall of foam—leaps and dissolves like the sea-flash swelling from her bow.

The poetry of this ship is in the craft of her time; it is wild, grotesque, rugged. We do not lose it until vessels grow to be very much alike—when a line of three-deckers has the sameness of a row of cottages, when you can't tell one frigate from another, one Blackwall liner, one Aberdeen clipper from another until she has made her number. It seems probable that the early Britons got most of their ideas of shipbuilding from their invasion by the enemy. The master of a coracle would be as much amazed by the apparition of the big galleys of Cæsar as were the natives of San Salvador by the ships of Columbus. We know that in two of Cæsar's galleys alone there were three hundred men. It has been calculated that the average burthen of those invading galleys was one hundred tons. Now, one hundred tons to a coracle must have been as is a thousand tons to a ten-ton cutter. If the ancient Briton had the seafaring instincts of his posterity, he would have seen much to admire and to imitate. It does not seem, however, when our early forefathers, stimulated by the results of their commerce with the Romans, turned their attention to shipbuilding, that they produced with that sort of success which might have hinted at the future that lay before the country. Probably their little merchant ships in years not long subsequent to the arrival of Claudius were much after the pattern that one sees on the seals of ancient corporations—such as Sandwich, Poole, Dover, Faversham, and other ports. The growth of the ship, in our country at all events, is here depicted in unintentional caricature. A seal, it is true, does not offer a large surface. The

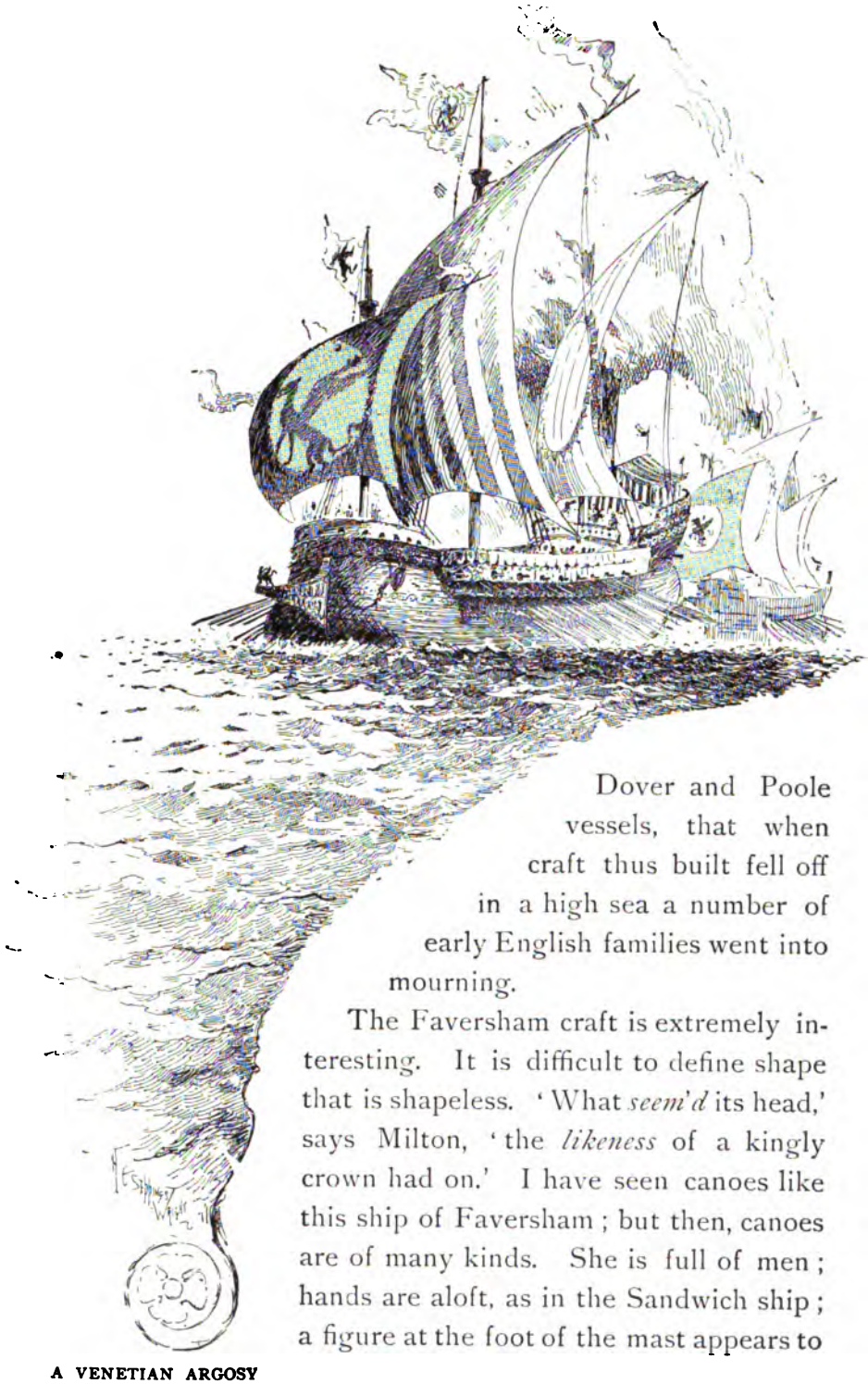
artist, moreover, wrought with primitive cunning; he squeezed perspective out of proportion, and the crew of his Sandwich

THE FLYING DUTCHMAN

ship, two of whom are jockeying a yard, are big enough to swallow the vessel. Yet these old seals provide a fair rep-

resentation of a species of craft whose ugliness and general unfitness would be in this age beyond the inspirations of nightmare itself to body forth. The hull of the Sandwich ship exhibits on the whole the cleanest lines; her sheer is not preposterous. The seal proves that A.D. 1238, English ships carried canvas which was furled aloft as now. The Sandwich craft also carries a longboat right amidships. The Poole ship, on the other hand, seems to have been the model adopted by the German toy-makers for their uncouth, gaudy ships for children: she floats on her garboard streak; her sheer is prodigious, and each end is castellated. We know the bow by seeing the anchor; but stern-way or head-way must have been all the same to this craft of Poole, after making every allowance for pictorial misrepresentation. This ship carries a single mast, with a yard across and a sail.

It is interesting to contrast these early English ships with vessels which were then afloat in the Mediterranean and gradually growing in bulk and beauty. We submit as a contrast a representation of a Venetian argosy. The ship of Dover, according to the seal of A.D. 1284, exhibits the same distressing disproportion of sheer which is found in the Poole craft. Why did those old people build such very high sterns? No doubt, to provide against being pooped. When a great sea boils over a ship's stern, carrying the wheel, binnacle, companion, and much other furniture along with it, she is said to have been 'pooped.' The old builders foresaw this peril; they knew that if the gale overtook the craft she must 'run' for it. Whilst she could be kept before the seas her castellated defences aft, rising into a poop-royal, would serve as a breast-work; if she broached to, the large hollow structure at either end would prove servicable for buoyancy. But I should consider, after a careful examination of the hulls of the



A VENETIAN ARGOSY

Dover and Poole vessels, that when craft thus built fell off in a high sea a number of early English families went into mourning.

The Faversham craft is extremely interesting. It is difficult to define shape that is shapeless. 'What *seem'd* its head,' says Milton, 'the *likeness* of a kingly crown had on.' I have seen canoes like this ship of Faversham; but then, canoes are of many kinds. She is full of men; hands are aloft, as in the Sandwich ship; a figure at the foot of the mast appears to

be praying to a star—he is probably an officer giving orders to the men on the yard. The seal of Michael Stanhope, Vice-Admiral of Suffolk, submits a ship of somewhat later date than those of Dover and the other ports. Here is a ship of four masts; a row of little cannon grins along her side; an affrighting beak projects half her length beyond her stem; she is exhibited with nothing but lower masts; the anchor is at the cathead; and the sail, glorious from the Herald's hand, swells from under her round top; the rigging is rattled down—in short, here is something that begins to look like a ship.

The art of shipbuilding in this country obtained a direct stimulus from the charter of Edward I. to the Cinque Ports. These ports were bound to provide fifty-seven ships whenever the king crossed the sea. Hastings, Bekesbourne, Rye, Winchelsea, Dover, Folkestone, Faversham, and Sandwich with Deal, with a few other places, were the towns which were obliged to contribute. The Britons were in advance of most nationalities to the extent of their traditions of chastisement; their coasts had been visited by many enemies; and, if it was a long time before our ancestors took it into their heads to build a stout, though by no means a tall ship, it was not because they wanted models.

Take the ships of the Norsemen, the famous ships of the Vikings. They were familiar objects, known not, indeed, all the way from China to Peru, but quite as far as distance and travel then went—namely, from Iceland to Constantinople; they defied the seas and smoked through the ocean when other sailors of their day were creeping along shore with faces gloomy with anxiety and uneasiness; they were rovers and were fired with the spirit of piracy, and their little ships were wonderfully well designed for the red trade of the raw bone and no quarter; they were so confident of success—*they* knew the life of the sea,

the dogs!—that they carried lumber-vessels with them stored with slaves, provisions, and munition of war, and when the prize fell easily into their hands the lumber-ship was loaded with booty.

Those who built the vessels of the Vikings were men of exquisite skill in their craft. They went to the sea for ideas. They eyed the wheeling gull; they studied the motions of the fish. Clearly they produced out of themselves without reference to what had been done elsewhere. The remains of a plank-built boat were unearthed in Denmark about half a century since. She was supposed to have been as old as the fifth century; her measurement was seventy-seven feet from stem to stern. It does not appear that she borrowed help from canvas. The rowers dipped their oars in chase, and flashed the delicately-shaped structure through as fast as a gale of wind could have driven her. Her sheer, her lines, are those of a clipper ship. The Yankees might have borrowed the hint of their beautiful Baltimore clippers from her.

She will stand for the typical ship of the Vikings whose fabrics may be thus described: they were clinker-built,[1] of unpainted oak; the keel was secured to the frame by iron spikes and scarfing. In some of the ships bast cord was employed to fasten the clabboards or planking to the frame timbers; in others the planking was secured by withes manufactured from the roots of trees. The typical Viking boat was caulked with loose hair of the beasts of the field, but some suppose that moss was also used. The beams of the vessel rested upon the top of the frames. She was pierced for oars. She carried a steering oar on the starboard side, and there is reason to believe that this helm was fixed, whether it was submerged to leeward or lifted high to windward. A writer,

[1] Clincher or clinker, pronounced with the *k*.

whose name I am unfortunately unable to quote, speaking of this rudder, says: 'This was the general, though not the universal custom, until the last quarter of the fourteenth century. The rudder is so represented on the Nesland church-door pillar, the time being 1242; whilst the "dragon ship" on the Bergen seal shows the helm astern. On the other hand, Lubeck's seal, 1249, a tomb in St. Denis, 1250, and the seals of Dover, 1281, all represent the helm on the starboard side.'

It is entirely consistent, however, with the history of British shipbuilding that the early shipwrights should have been reluctant and slow in their adoptions from foreigners or foemen. We were quick to borrow ideas, but in insular fashion we waited until they were brought to us. Abroad they were making a fine art of the industry, whilst we were rendering our home waters hideous with grotesque and monstrous shapes. What could float with a more dream-like carriage, with her curling pennon and gorgeous canopy, than the ship of the Doges of Venice? Steinitz, in an account of the 'Origin and Progress of the Ship,' preserves a description of two ships built by the Genoese for Louis IV., King of France. They were alike, he says. Their measurements appear to have been misstated. The picture of one of them represents a fabric finely lined, with a good but not a ridiculously dominating sheer of bow; she is handsomely moulded aft, and is promising apparently in all needful stability; she is rigged with a lofty mainmast spanned by an immensely square yard. Steinitz speaks of a fore-yard, but in the picture before me there is no foremast. 'Four thousand ells of spun hemp to supply cordage, &c., was allowed to every ship, and they had six cotton sails; . . . each ship had twenty-six iron anchors' (probably for distribution); . . . 'the two ships were to be furnished with stabling to carry one hundred horses between

A VIKING SHIP

them, and they had fourteen hawsers for fastenings or moorings in port. The cost of these two ships with all their stores was fourteen thousand livres Tournois.'

A peculiar interest attaches to the ships of the Genoese. Unfortunately, little reliance is to be placed on the description given of them. Lindsay falls foul of Admiral Napier (who was a post-captain in the Royal Navy when he wrote his book), for affirming that a Genoese craft could spread a single sail containing fifteen thousand square feet of canvas. The figure Napier represents the ship to have made is certainly an extraordinary one. Although she was only two hundred and seventy tons (in our measurement) the girth of her mast was thirty-eight feet! This beats the rig of that mighty vessel which was so loftily sparred that young sailors who climbed her masts to furl her canvas descended grey-haired and wrinkled men. Napier, proceeding, quotes from Cambi, who represents this wonderful ship to have been furnished with seventy cabins and a longboat of a capacity of seventy-two tons. 'This,' says Napier gravely, 'was the largest vessel that had been seen in a Florentine port for a long time, and no ordinary seamanship must have been necessary to manage so unwieldy a sail as she seems to have carried.'

There can be no doubt that the competition of maritime supremacy between the Italian republics greatly promoted the science of shipbuilding. Whilst they were foemen they laboured to produce the best fighting ships; when they were at peace their business and their ambition was to produce a handsome and a remunerative class of merchant ships. The Genoese were happy in their designs, but their taste in decoration was so bad that it is scarce imaginable of the savages of the South Seas. The nobles' craft, however, the heroic ship designed for the great, for princes, for persons of wealth and

importance, was lifted into dignity by the magnificence of her furniture. It would be impossible to figure the carvings and ornaments heaped upon the bows and sterns of these ships.

THE BUCENTAUR

Ancient tradition still clung, and those early mariners loved to gild their craft. It is William of Malmesbury who records

a gift made by Harold, King of Norway, to Athelstan: it is a ship adorned with a golden prow; her sail was purple and her bulwarks were lined with shields. The Genoese seem to have admired this sort of thing. If they painted their ship white they must needs give her a wall-paper look by covering her sides with vermilion crosses. Sometimes their ships floated in black and white in a foliage-like intermingling. When the ship's side was of a dead black all the ornamentation was of a dazzling crimson.

But the Genoese were not the only offenders in this wild love of water pageantry. There is extant a description of Sir Philip Sidney's funeral, extracted from the 'Book of Funerals' of Nicholas Dethick, Windsor Herald; and this is how the ship in which his body was conveyed to England was equipped: 'Whose corse was the 4 of November brought up the river Themmes in his barke, all blacke sayles, masts, yardes, &c., with blacke auncient streamers of blacke silk, and the saide ship was hanged all with blacke bayes and scochions thereon on past bord (with his and his wyfes impale helme and crest).' Our ocean conceits of to-day are happier, if less picturesque, than these mediæval vagaries.

Of all the parts of the old ship, whether of the Genoese or any other nation, the stern—its shape, its decoration—seems the detail that gave the shipwright most trouble. We in our time have seen square sterns yield to round sterns, and these to the elliptical form. Last century and in this they had a narrow-headed stern, and the ship that carried it was called a Pink. Mr. Thearle, in his excellent little work on naval architecture, declares that in no part of a wooden ship have differences in style been more marked than in the stern, 'and the problems in laying off,' he adds, 'have been similarly influenced.'

There lies before me an old book by a shipwright; he undertakes to teach the world how to build ships. He says his book is the product of thirty-two years' experience; 'for 'tis very well known,' says he, 'that I have been so long imploy'd in her Majesty's service and that of her royal predecessors.'

This old gentleman was dejected by the suspicion that his noble calling was looked down upon. If he be right, his statement may perhaps explain how it happens that the art of the shipwright in England in design and equipment made hardly any progress, spite of the influence and teaching of the foreigner, from the days of the Charleses down to the time when our capture and appropriation of French hulls obliged us out of admiration to copy them. Nor will this take us back much more than a century. But let us hear the old gentleman: 'Besides, the proper Business of a Shipwright is counted a very vulgar Imploy, and which a Man of very indifferent Qualifications may be master of. Many have as mean an Opinion of it as a certain gentleman who told one of our former Master Builders, that he had a Blockhead of a Son uncapable to attain any other Trade unless that of a ship-carpenter for which he designed him.' This old author is very desirous that a ship first of all shall be beautiful, but he requires that her adornment shall prove no detriment to her qualities as a sea-going vessel. What is his idea of beauty? Hear him: 'A ship may, and indeed ought to, be formed as near a globular figure as can possibly be allowed with respect to the other conveniences that will be requisite in managing of her.' Happily the contemporary shipbuilding world was not to be wholly influenced by this old grumbler. Instead of launching ships shaped like globes, so that you would have to look over the side for the rudder to tell one

end from the other, they built a ship about two and a half, and occasionally two and three-quarters, longer than she was broad. In Queen Anne's time the shipwright was not retrograding, but his advance beyond the Elizabethan period had been by no means considerable, nor in any way proportionate to the advantages he possessed over the builders of the ships of Drake and Hawkins. Our artist has given us a sketch of one of the ships in which Sir Walter Raleigh sailed or had command. It will be seen that she was a tub, metaphorically, but she was not a globe. She is extremely interesting as an example of the advance of shipbuilding since the times of Henry VI. I observe that this vessel is portrayed as without top-gallant sails. Raleigh, in his 'Remains,' speaks of top-gallant sails as having been introduced in his day, along with many other details of ships' furniture of interest to the marine student. This ship was a lumbering man-of-war, and is covered with sails, of which many have long since been discarded. The sprit-sail and the sprit-sail topsail, blowing the first from the bowsprit, the second from a little mast on the top of the bowsprit, disappeared somewhere about the close of the last century or the beginning of this. The bonaventure has been furled for ever. The cross-jack yard has preserved its name; but it has been squared by the lifts, and no longer makes a lateen sail of the cloths which it spreads. This type of ship was practically afloat down to the middle of the last century, and perhaps later. She was changed only in rig—that is, she was more loftily equipped.

The English shipmen's dream of safety and stability lay for years and years in the magic word 'beam.' There was so much beam that it ended in being nearly all bow, and sailors looking over a ship's head would growl that she could shove an empty bottle a mile along with her. Beam is a very good

thing, but when it's overdone (and it used to be shockingly overdone) it rolls horribly. I have seen a craft, whose length was a little more than three times her breadth, rolling lightly but deliberately in waters in which not a pulse of swell was visible or expressed by the movement of shipping about her. She was an old ship; she cherished her memories; she had been born to roll, and nothing short of stranding her could have stilled her.

A GENOESE CARRACK

Sir Richard Hawkins speaks with heat of the behaviour of the courtly gentlemen who volunteed for the sea in his time. Nausea drove them out of the service; they could not endure the rolling. Many of the unhappy gentlemen were clad in armour, and the weight of their apparel ran them from side to side or threw them. They were wise to give up. On the field of battle these gentlemen might have covered themselves with glory, but how could they flourish a sword or take aim with a

piece of artillery when they were too ill to stand? It is only necessary to think of such ships as Dampier's and Anson's to appreciate the sort of love the mariner of that and an earlier age would cherish for the shipwright. Dampier's ship, the 'Roebuck,' was not only a globe, in our old shipwright's sense, but a sieve after the pattern of a basket. All the way round the world it was pump, pump, with those livelies from morn till night; and the ship nearly broke the great heart of the buccaneer. He left her bones off the island of Ascension, and was not a little rejoiced when he found himself upon the comparative *terra firma* of the deck of one of some ships that had looked in at the island.

The 'Centurion's' consort, as every reader of Anson's memorable voyage will recollect, occupied weeks in striving to measure on a bowline the distance that separated her from Juan Fernandez. From the island they would see her hull to the water line, and believe by next day she would have 'fetched' in; but next day nothing but her topsails showed above the sea-line; they disappeared, and then for a week she was crawling now on one tack, now on the other, out of sight.

Sailors in olden days must have been sheep-like in patience. It is true that when a man made sail from the Thames he went prepared for months, running into years, of salt water. The patience I refer to is the capacity of enduring the hindrance of light head-winds, the abortive struggles of the precious round-bow driven through it dead to leeward, with the yards fore and aft; above all, the long calms of the tropics, when the fresh water stank, when the ship's bread crawled on the toes of the innumerable sea-worm that dieth not, when the scurvy was clapping the grinning mask of anguish and death upon your shipmate's face, and when, if you looked over the ship's side into the sea, the water burnt, the sea-snakes revolved in

wheels of fire, and you saw things with the eyes of Coleridge's Ancient Mariner. But those seamen who thus endured were the men who mastheaded the flag of your country. Honoured be their names! It would be absurd to say that we shall not look upon their like again. They are with us in their children. But I say, hat in hand, with deepest reverence, when I think of their ships, their slender equipment, the unknown, measureless seas of those ages, that the sailor of old times was a *man!*

Before I return to the ship as a ship, let me say a few words about the language with which the old craft was handled; and my reference will be scarcely less applicable to the shipboard work of the sisters of the 'Great Harry,' than they strictly are to the times when Gay was writing 'All in the Downs,' and Swift was describing a storm at sea in 'Gulliver's Travels.' Swift's storm at sea! Did you ever read it? Did you ever read the little book out of which he almost bodily lifted it? It is called 'The Mariner's Jewel,' and it is the work of one Mr. James Love. No doubt the shipwright as well as the great satirist found it a useful little volume. It told him how to discover the burden of ships and how to rig them, how to make and proportion masts and yards, 'with several other things needful to be understood by all sorts of seafaring men.'

The old fellow figures a ship in a variety of situations. The seamen get their anchor, and old Love, probably with a speaking trumpet under his arm, sings out the following orders: 'The wind is fair, though but little, tho' it comes well, as if it would stand; therefore up a Hand and loose your fore-topsail in the top, that the ship may see we will sail.' There is a gleam of sea poetry in this touch, '*that the ship may see we will sail.*' In these days of iron the old sentiment of the ocean is as dead as the rivet that holds together the

ship's plates; and the man who attempts to express the beauty of the full-rigged ship, and the red Atlantic sunset, and the frothing ridge of the Horn's surge, is laughed at for his pains by ship-masters and chief mates and second mates. But in Love's time there still nobly flourished many traditions of the sea, generated by the enterprise of the older explorers; and amongst the notions which were graven on the soul of the seaman was the belief that a ship had something of human life in her—that she understood what was going forward, that she had an ear for your speech if you addressed her. Thus, even down in times so recent as those of Dana, we find the mate of the ship hurrahing the old bucket as she storms along, slapping his thigh, and talking to her as he might to his wife.

After James Love has lifted his anchor, he puts before the wind, and things go very well, in an extremely old-fashioned style, for awhile. The ship then meets with very heavy weather. I quote the following passage as an example of the sea language of Queen Anne's time, and also as showing where Mr. Gulliver found his nautical experience:

'We make Foul Weather, look the Guns be all fast; come, hand the Mizzen, the ship lies very broad off; it is better Spooning before the sea, than trying or hulling; go, reef the Foresail and set him; haul aft the Foresheet; the helm is hard a Weather, mind at helm what is said to you carefully: the ship wears bravely, steady, she is before it; belay the Foredownhall; it is done. The Sail is split, go haul down the Yards and get the sail into the ship, and unbind all the things clear of it. Starboard, hard up, right up your helm; Port, Port hard; more hands, he cannot put up the helm; a very fierce storm, the sea breaks strange and dangerous; stand by to haul off upon the Lanyard of the Whip-staff and help the man at the helm and mind what is said to you. Shall we get

down our Top-mast? No, let all stand, she sends before the sea very well; the Top-mast being aloft, the Ship is the wholesomer and maketh better way thro' the sea, seeing we have sea-room. *Thus you see the ship handled in fair weather and foul, by and large: now let us see how we can turn to Windward.*'

This is the speech of the sea-spectre; it was once a very real note, dangerous to those who defied it. In this language we beat the Dutch, and were gallantly beaten by the Hollander in return; and in this language we gave chase to the Frenchman, and towed him home—though it must be admitted that in those days Johnny frequently succeeded, under the influence of a liquor called brandy and gunpowder, in clapping old Mr. Love and his hearts under hatches, and carrying them off to miserable captivity.

RALEIGH'S SHIPS

## III.

IT was long a tradition—it may still linger—that on the summit of one of the heights of the Azores there stood a mighty figure in stone of a man on horseback pointing into the west. It was a hint, however, that nobody seems to have paid much heed to before the time of Columbus, unless we are to believe what is related of that extremely apocryphal Welsh adventurer Madoc, for whom, to the lasting glory of the little principality, is claimed the discovery of America.

The ships of Columbus are the most interesting vessels that were ever built, that were ever afloat, that are to be read of in ancient or modern literature. All the significance of the great discovery, and the mighty issues of prosperity and spreading civilisation which we in this age are privileged to behold, are in them. The life, too, of Columbus is the most affecting piece of biography in the world; and his ship, the ship in which he first made sail, the ship in which we think of him as standing, austerely silent, bending a falcon gaze over the bow at the reddening desolate sea of the west—that ship fits his story as his shadow fitted his figure. There were many larger ships afloat than the craft in which Columbus made sail. The great-hearted seaman was glad to take the best he could get. The Andalusian shipowners had resisted a royal decree that they should provide three vessels ready for sea within ten days: they viewed the proposed expedition as the scheme of a lunatic dreamer. Columbus found it very difficult to collect

crews. It was pre-eminently the age of marine superstitions. The sailor exorcised the demon of the waterspout by holding up anything in the shape of a cross and mumbling an Ave. Bald-headed, jolly-faced old men, with shining black eyes, and knees terminating in a tail of about the length and size of a hammer-headed shark's, swam alongside, grinned up at the astonded mariner, and sank from his sight. Lamps kindled by the hand of spirits burnt in the rigging at night, and the superstitious seamen on bended knees listened to the faint sweet music of heaven, though it might be no more than the melodies of the shrouds wrought into a celestial choiring by the mysterious presence of the—corposant.

Those who wish to know how ignorant and superstitious the seamen of the Middle Ages were, should read the collections of Hakluyt (this work is fascinating in black letter), of Purchas (whose pagination runs into thousands), of Churchill (whose six volumes embody the relations of a number of Jesuits), and Harris (an indifferent collection). I need refer to no more. There is plenty to read here.

A model of Columbus's ship was at the World's Fair, and so all the world has seen her. Whether that reproduction was in all ways accurate matters little. I have seen a picture of her, and she certainly looks uncommonly like the ship that Columbus sailed in.

It is difficult to describe the ship of the Columbian age. The seamen of her day no doubt had names for her different parts, but the need of those names went overboard long ago, and the clumsy appurtenances of the stem and the stern, of the main deck and the mainmast-head, stare, without power to render themselves intelligible by expression, from the pictures of fifteenth-century shipping. There lies before me a print of something that Columbus might have sailed in, or if not

THE SHIP OF COLUMBUS

Columbus then Martin Pinzon. Her stern is crowned with a structure closely resembling a gigantic pigeon-house. How she was steered, by what extraordinary efforts the sailors succeeded in trimming their mizzen when the wind shifted, the picture sayeth not. Her figure is that of a cask sawn in halves lengthwise and raised up at both ends. Such a contrivance might be safely trusted to blow along before the breeze; but it is impossible to understand how vessels thus built and rigged managed to keep a true course when they braced up their yards.

In the ships of Da Gama we witness a form and type which seem something distinct, and which are certainly cheering. That the little squadron was composed of vessels of burden may be gathered from the royal directions: 'The king ordered the ships to be supplied with double tackle and sets of sails and artillery and munitions in great abundance; above all, provisions, with which the ships were to be filled; . . . all sorts of merchandise of what was in the kingdom, . . . and cloths of gold, silk, and wool, &c., &.' They reckoned ships' tonnage in pipes of wine; and the burden of the 'San Gabriel' on this basis has been calculated at three hundred and fifty tons.

From the summit of Table Mountain on a clear day one may obtain a view of the distant finger-like point of Agulhas. To stand upon that commanding height and witness in a vision the little ships of Diaz and Da Gama struggling round the Cape of Storms would surely be to dream nobly. From that majestic altitude, indeed, we might in imagination behold such a procession as should tell in the space of a dream the whole story of the ship from the days of Diaz down to this present noon of eight bells. The clumsy sturdy wagons of the Dutch, the Portuguese felucca, those heavy lumpers, our early Indiamen, their stately successors the Indiamen of the first half of this century, wooden ships and iron ships, then little steamers with

paddle-wheels, then bigger steamers, and now the giantesses which make for Australia and New Zealand by way of the Cape—all would pass! A procession to keep one's hands lifted. What an amazing growth! What admirable skill! How gloriously heroic are those quaint little figures of ships in the van! How suggestive of the silent, irresistible forces of Nature the magnificent steamer that closes the rear!

It is not until we come to the reign of Henry VIII. that we meet with anything large and important in shipbuilding. Particulars are extant of a large merchant-ship of 1531. I submit an extract from her inventory translated into modern English. She had been surveyed by one Christopher Morris, who thus delivers himself: 'The ship has an orlop deck; a forecastle and a close timber deck; above the forecastle a deck from the mainmast aft; a mainmast of spruce scarfed with the same wood; a new mainmast yard of spruce of one piece.' Then Christopher tells us of tackles and shrouds, brass sheaves for blocks, lifts for the yards and halliards to hoist the sails with, a new main-top, top-mast and its furniture, and so on. The sailors found plenty to handle in this ship—things with very queer names—such as *pollys*, now called blocks. Yet on the whole it is the spelling rather than the names which makes the nomenclature of the sea of those times queer and grotesque. The terms are like the cries of a giant infant; we have softened down and rounded them off, but all the same we have retained for the most part the giant infant's expressions. They were good; we could not sail a ship without them in these days. The master-rigger would want a language if the inventions of the giant infant were struck out of the sea-tongue.

The 'Great Harry,' according to James, the naval historian, was built in the third year of the reign of King Henry VII. (1488); and he speaks of her as the first ship of the Royal

PORTUGUESE FELUCCAS

Navy—that is, as belonging to the nation, though he thinks there is reason to believe that Richard III. owned a few of the ships he employed. The 'Great Harry,' was afloat for sixty-five years, and was at last (says James) accidentally burnt off Woolwich in 1553. It will presently be seen that Sir Richard Hawkins says this ship was lost by foundering.

The great ship of the age of King Henry VIII. was the 'Harry Grâce à Dieu.'[1] She sat like a castle on the water. Aft she is all poop, and forward she is all forecastle, and in the well between there seems not to have been much room for the sailors to run about in. Her rig is delightfully odd. One thinks whilst looking at her of the ingenious manufactures of Nuremberg. She had four masts, and something answering to a mast, but not in the least resembling a bowsprit, projected from her bows. She had tops shaped like teacups, and in the print that I examine I seem to see a top-gallant yard lying square under the flag that blows from the topmast head. She appears to have been a vessel exceeding a thousand tons burden. One cannot but wish that it had been in any way possible by artifical means to petrify the old wagon, so that at this hour she might be standing up, masts, yards, and all, somewhere within convenient reach of the crowd. She would be accepted as one of the greatest wonders of the world. She carried 'a great plenty of cannons,' all of them strangely named. For example, she had three 'di-cannons,' four 'sakers,' two cannon 'pesers.' She had pieces for the tops and guns for the hand. Other cannon with alarming names peeped out of her. She was also handsomely equipped with arrows, pikes, bows, and darts. They were still a little young in her day as seafarers; yet here was a ship with her three hundred and forty-nine soldiers, her three hundred and one mariners, her fifty gunners, her nineteen

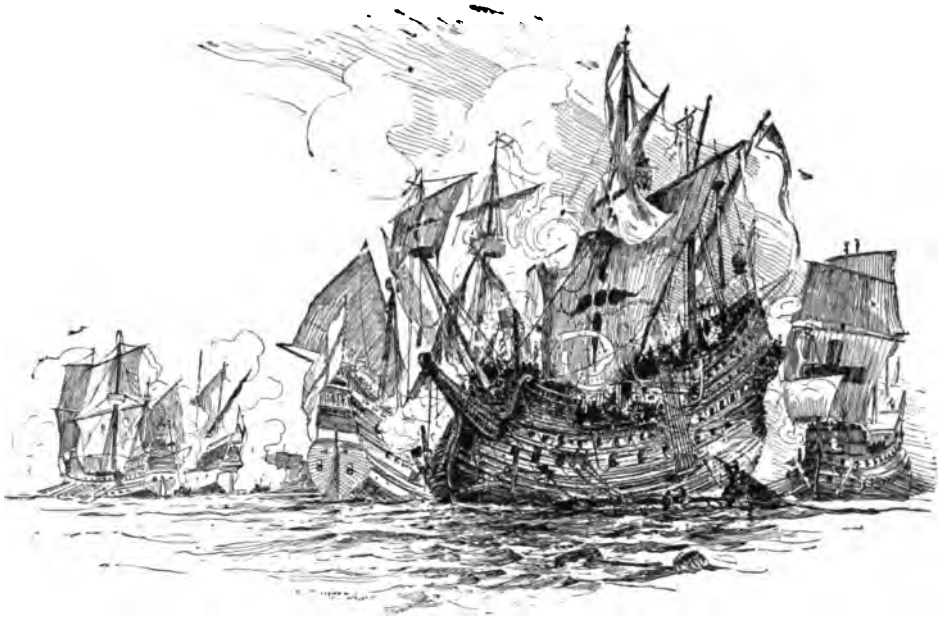
[1] I grow a little addled over these old names, and may possibly mistake one ship for another.

brass pieces, and her hundred and three iron guns capable of proving much more than merely a terror to anything flying the flag of an enemy within the sea-girdle visible from her lofty poop.

It should be said, however, that, if not so formidable, at least as big, or even a bigger ship, was built in Scotland nearly half a century earlier than the 'Harry Grâce à Dieu.' The building of this ship almost denuded Scotland of its timber. Dr. Samuel Johnson does not appear to have heard of her. She cost thirty thousand pounds in the money of that time. James IV. then ruled Scotland, and he appears to have been very proud of this vessel. Whilst she lay within reach of him he visited her daily, and he dined and supped in her, and was never weary of roaming about her with his lords, and showing them her guns and carrying them to the places where they kept the powder and shot. Her dimensions are thus stated: 'She was twelve score feet of length, and thirty-six feet by two in her sides.' Her historian says quaintly: 'If any man believe that this description of the ship is not of verity as we have written, let him pass to the gate of Tillibarden, and there before the same he will see the length and breadth of the "Great Michael" planted with hawthorne by the wright that helped to make her.'

The names of the various portions of a ship of the days of Mary, and Elizabeth, and James I., will be found in Sir William Monson's Naval Tracts. Some of the expressions puzzled James the historian. 'The couperidge-head murderers; they make close the forecastle and half-deck. Lockers are the holes the pintle of the murderers goes into.' The 'murderer' was a small cannon; it was fitted forward, with elevated muzzle, and James seems to think that it was intended to sweep the rigging and tops in case the enemy boarded and gave trouble aloft. But surely its muzzle could be depressed when occasion arose!

Be this as it may, in wooden shipbuilding, Monson's terms, modernised, might pass, with very few exceptions, as currencies of the yards in any nautical dictionary of to-day. I have a great liking for the character and writings of this old sea-officer of the days of Elizabeth and James. He helped fight the Spaniards of the Armada, when a lad, in the 'Charles' pinnace. He saw a great deal of service, and was associated with many mighty men—Sir Francis Drake, Sir John Hawkins, and his



THREE-DECKERS OF THE ARMADA

incomparable son Richard, the Lord Thomas Howard, Frobisher, Fenton, Grenville of the 'Revenge' (whom he spares not, by the way, for losing his ship), and scores more of the burning hearts of those 'spacious times.' He wrote in his old age a little treatise on the building of ships, every word of which, for the truth, directness, and beauty of the expression of the whole, I heartily wish I had space to quote here. In this treatise he deals entirely with ships of war. He tells us

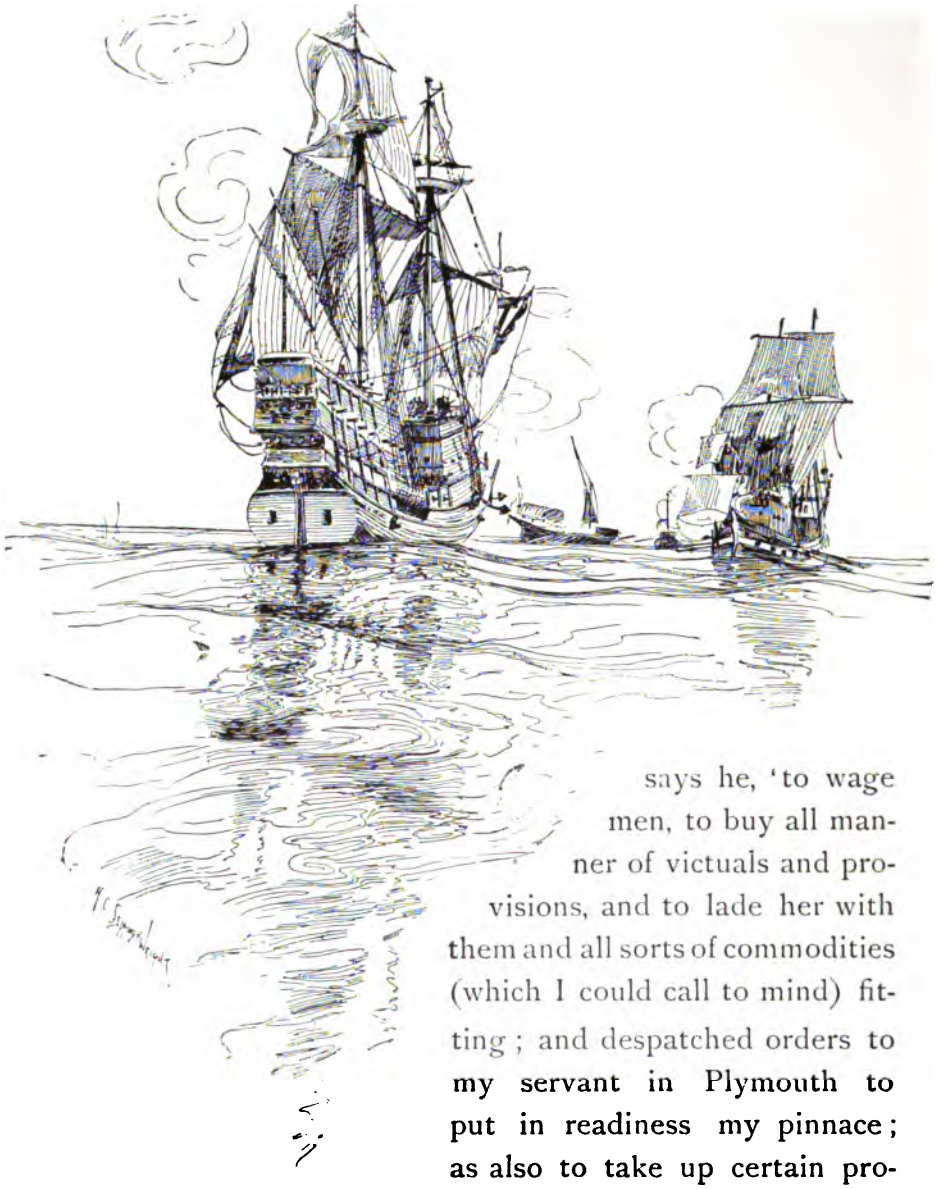
there are two ways of building ships: 'the one with a flush-deck, fore and aft, sunk and low by water: the other lofty and high, charged with a half-deck, forecastle and copperidge-heads.' He chooses the flush-deck ship to fight in; she is commonly fast, but she must not allow herself to be boarded. The other ship provided what the seamen of old days called 'close quarters'; they fired from behind defences, and often cleared the decks and brought their ships off after things had looked desperate. He commends, however, a tall ship for these qualities; first, for the majesty and terror that she is to her enemies; next, she provides room for her men; she is able to carry more and heavier artillery than a low, flush-decked ship; then she will overtop a deeper and snug ship; and finally her men cannot be very easily seen owing to the waistcloths.

All this seems pretty obvious, and yet it remains the puzzle of to-day. Are we to oppose the enemy with the majesty and terror of giant ironclads, every one of which, if she sinks, whether by the torpedo, the shot, or the thrust of a friendly ram, carries with her the value—running hard into a million—of a whole squadron of ships of Nelson's time? or shall the navy of Great Britain be composed of vessels of comparatively small displacement, armed not less formidably than the huge ironclad, but capable of doing infinitely more execution by virtue of their speed and comfortable behaviour in tumbling waters? Thus the same problem is handed on from generation to generation. It was the galley in Monson's time; it is the torpedo-boat in this. Happily we move a little faster than did, or rather could, those old hearts of oak; and how fast, and with what judgment, let all interested in such things—I fear in this maritime country they are not too numerous—read with attention in the admirable History of the Royal Navy written by Commander Robinson, R. N.

In spite of bulbous runs and bows built on the hint of the apple, ships in the days of Monson do not appear to have possessed the stability you would expect to find in them. It is quite true that they overloaded, just as we do, without our excuse: we know all about the metacentre and another centre of stability; we know all about heights of side; and we have the load disc,[1] which is grimly accepted as a warranty of seaworthiness: thus we send our ships away to sea to shift their cargoes and to drown themselves and their men, and it is all good because it is all scientific. Of yore they were not scientific; but there was so much ambition of safety in shipbuilding, according to the raw fancies of those primitive yards, that it is surprising they did not make better provision, whether by bilge keels or by greater depth of moulding, against oversetting. There was also much loss of life and ships through neglect in attending to the lower ports, but often through the ship being weighted by her freight of guns and commodities down to a point that brought her lower ports almost flush with the water. Sir Richard Hawkins, who made a memorable voyage into the South Sea in the year 1593, nearly lost his ship from this cause. She was about three-hundred and fifty tons, and appears, from what Sir Richard tells us, to have been a delightful ship to look at. Queen Elizabeth, indeed, when the 'Repentance' (as she was first called) was at anchor off Deptford, happening to pass in her barge on her way to her palace at Greenwich, was so struck with the vessel that she ordered her people to row round her; and the Queen could find nothing to dislike but the name of the vessel, which she commanded Sir Richard to change into the 'Daintie.' Yet this same 'Daintie' was nearly lost in the Thames, whilst starting on her first voyage, through overloading.

[1] The Board of Trade have unconstitutionally done away with the Plimsoll mark. A graver question is the underload-line (1899).

One thinks of the tragedy of the 'Eurydice' on reading Sir Richard's remarks, quaint in their old English dress. 'I began,'



SPANISH GALLEON, SILVER FLEET

says he, 'to wage men, to buy all manner of victuals and provisions, and to lade her with them and all sorts of commodities (which I could call to mind) fitting; and despatched orders to my servant in Plymouth to put in readiness my pinnace; as also to take up certain provisions. . . . The eight of April, 1593, I caused the pilot to set sail from Blackwall, and to vaile

down' (that is, to sail down under lowered topsails) 'to Gravesend, whither that night I purposed to come. And for that she was very deep loden; and, her ports open, the water began to enter in at them; which nobody having regard unto, thinking themselves safe in the river, it augmented in such manner as the weight of the water began to press down the side more than the wind: at length, when it was seen and the sheets flown, she could hardly be brought upright. But God was pleased that with a diligence and travail of the company she was freed of that danger; which may be a gentle warning to all such as take charge of shipping, even before they set sail either in river or harbour, to have an eye to their ports.'

The 'Great Harry,' he tells us, went down through this omission to close the ports, just as two centuries afterwards the 'Royal George' foundered from the same neglect. Plenty of beam was no guarantee of stability against overloading or the shifting of cargoes. Yet ships were so low-masted, carried canvas so disproportioned to their bulk, showed such prodigious freeboards, and ran from stem to stern in such inconceivable 'springs,' that, providing the mariners paid attention to the holes in their crafts' sides, one should think it impossible that they could founder, even in a hurricane, any more than a headed cask.

On page 54 is an example of two ships of a later date than the 'Daintie.' You would say that with their ports carefully seen to they could wash about the ocean until with grass and weeds they ceased to look as though built by human hands.

The story of the ship involves her internal government, and one wants to know what sort of discipline was to be found on board those old vessels, some few of which were occasionally going down on account of their portholes being left open.

Some answer to this may be found in the instructions given by the Earl of Lindsay in 1635 to his captains. The keynote is struck with the devotional spirit of the age: the chief in command is to take care that all the officers and companies of the ships worship God twice a day. Swearing, drunkenness, robbery, sleeping on watch, and the like, were to be punished according to the order and custom of the sea. Punishments were brutally severe in those times. They marooned: that is they set a man ashore alone on a desolate coast or island, and left him to starve, to be destroyed by savages or wild beasts. They keel-hauled: that is, they dragged a man naked by yard-arm whips under the bottom of a ship, and drew him up raw and bloody with the harsh wounding of barnacles and spike-like adherences, only to be submerged afresh ere the unhappy miscreant could fetch a full breath. They nailed a man to the mainmast by driving a knife through his hand. For murder, that was often manslaughter, they tied the living to the dead back to back, and threw them overboard.

But to return to the discipline of the old ship. They were to be very careful of fire; in case cannon-balls went through the sides, men were to stand by in readiness with salted hides, sheets of lead, and other sorts of plugs. They provided for thick weather by beating drums, blowing trumpets, ringing bells, shooting off muskets. This is the discipline of the man-of-war; I suspect it was not to be found in the merchantman. My lord speaks of a noise of trumpets. Ships in those days carried trumpeters as a part of the crew, and they were used as a sort of 'beefeater,' for ornament; yet their services were in frequent demand, and wonderful stories are told of the old trumpeter who, despite overwhelming odds, would maintain the spirits of the crew of his galley, whose bottom was a shambles, by blowing until he fell dead, trumpet at lip. His

SHIP *tempore* CHARLES I

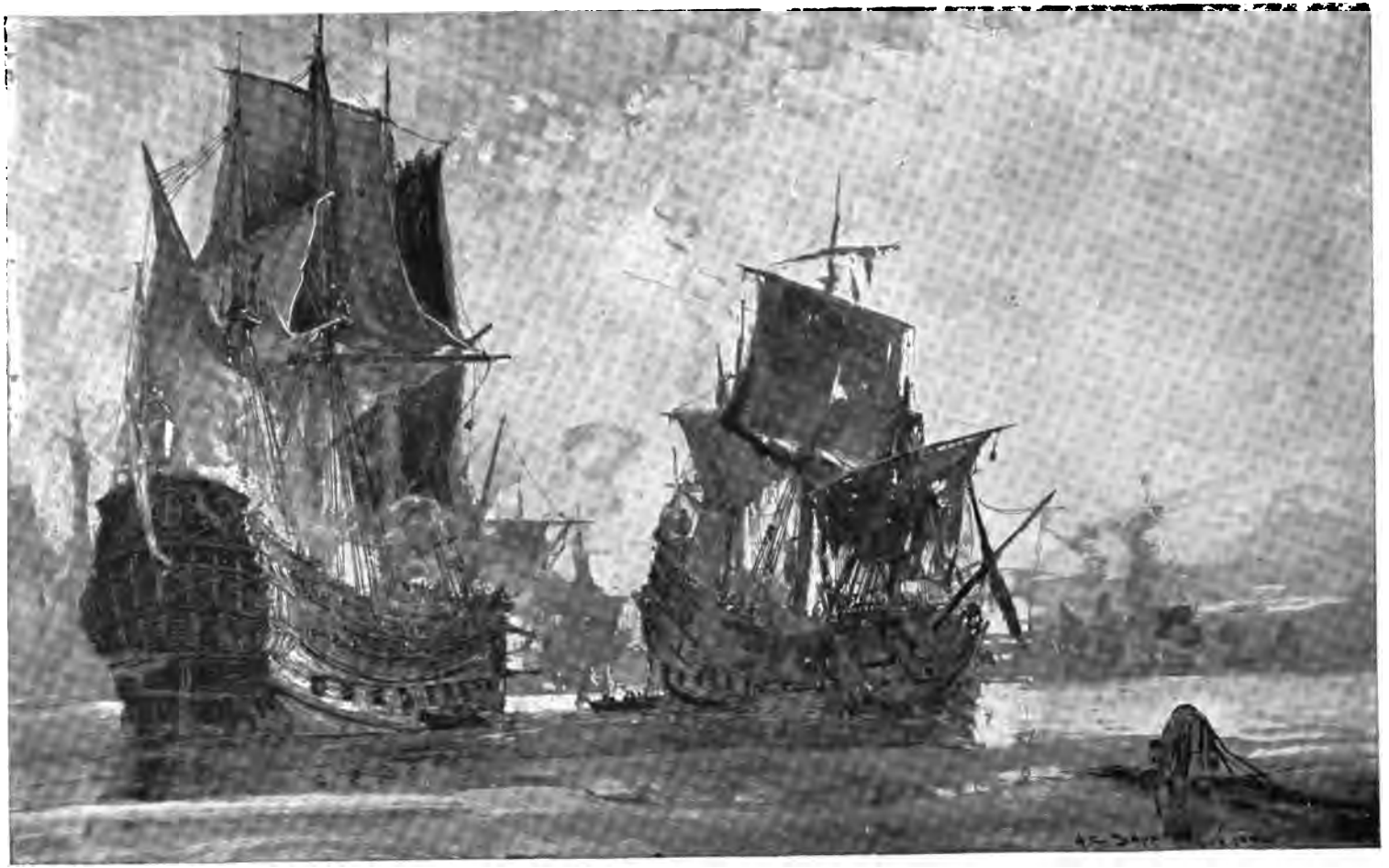
trumpet was sometimes of silver adorned with banners of silk of the Admiral's colours. He was a kind of ship's footman, and showed people in and out.

Progress in shipbuilding in Great Britain in the seventeenth century was not a little due to the spirit of the Dutch, who, while England was fighting for her liberty at home, had become a free republic and the masters of the seas. The ocean swarmed with their merchantmen. The English East India Company, then in its infancy, was obstructed and outraged by the Dutch and the Portuguese in Eastern seas. Particulars are given by Lindsay of the difficulties the English encountered. Of eighty-six ships which the East India Company had despatched, eleven were seized by the Dutch, nine were lost, five were worn out by long service, and only thirty-six had arrived with cargoes, the remaining twenty-five being then in India. These figures are quoted from a return presented to Parliament in 1621. The supremacy of the Dutch in trade was undoubtedly owing to the superiority of their ships. They never could lack plenty of seamen to man their vessels, thanks to their fisheries. The Dutch sailors in fearlessness and seamanship were equal to the English. Some of the Dutch East Indiamen of those times were splendid ships, as ships then went—out and away superior to anything that we had afloat for commercial purposes. One admires them in old paintings. Their sterns were scarcely less sumptuously decorated than those of such three-deckers of modern times as E. W. Cooke delighted to draw, and drew inimitably well. They preserved the old lines—the towering poop, the peculiar droop of the bow; but in point of scantling, in equipment, decoration, discipline, number of crew, they were noble examples of the shipwright's skill, and honourable to the wonderful struggles and amazing progress of the most remarkable and interesting of the nationalities of Europe.

We owe the Navigation Laws,[1] amongst other causes, to Dutch predominance at sea. Those laws concern us here only to the extent of the spirit they appear to have infused into British shipping. It would appear that between 1666 and 1688 the merchant shipping of this country had doubled, whilst the Royal Navy had increased in tonnage from nearly sixty-three thousand to over a hundred and one thousand. From the angry discussions raised by the passing of these Acts we get some facts of interest. We find that there were plenty of people who were swearing that if the trade of the country was not protected by heavy customs duties, amounting, according to some suggestions, to 50 per cent., the Danes, Swedes, Dutch, and others would ruin the nation, because of the difference of the cost in the building of the requisite ships for commercial purposes. An example is given of that long defunct craft, the flyboat. In Scandinavian countries the cost of building such a vessel of three hundred tons was about 1,300*l.*; in England she could not have been constructed for less than 2,4000*l.* It was declared that the average cost of an English ship was 8*l.* a ton, and that of a vessel built in a Scandinavian yard 4*l.* But, Dutchmen or no Dutchmen, we went on building briskly and doubling our output, and in the middle of the seventeenth century, or somewhat later, England had some stately ships of war afloat, of one of which the artist has given us an example.

Here we have a picture of that sort of ship on which Blake curled his whiskers and which gave much trouble to the Dutch. She is an odd, ungainly figure, owing to her bulky stem and long beak; but the practised eye of the sailor climbing her heights will note with satisfaction that she is loftily clothed to her trucks just as ships now go. And yet, much as we may admire this ship, we do not observe the great change we should

[1] I do not refer to the earlier Navigation Laws.



TYPE OF ENGLISH AND DUTCH MEN-OF-WAR—*Time of Van Tromp*

expect to find in the shape since so long before as the day of the 'Harry Grâce à Dieu.' She is a tall ship, and for her time no doubt she is a great ship; but she still remains that type of vessel to whose dulness in sailing, slowness in wearing, failure in tacking, must be humanly ascribed much of that very strong speech which is still to be heard uuder both flags. Figure such a craft running before a heavy Cape Horn sea: at every lunge she sinks her unneccessary beak, and it is all white water to abaft the gangways. Figure her close-hauled, 'looking up' for something very much like herself on the weather bow. She will lie within seven points of the wind; but what leeway are we to allow her? in what direction does the wake stream off when you look over the weather quarter?

These ships of war, however—Dutch, English, and French being pretty well all alike—pummelled one another on an honourable footing: no advantage could be taken; the wind that gave the Englishman five points of leeway was also driving the Dutchman to leeward like a balloon. If one manœuvred sluggishly, the other's motions were equally dull. Well would it be for the British if they could continue to fight at sea on the same terms and under the same conditions as their forefathers fought! I should like to see the boarding-pike in Jack's hand again. Who is the 'naval expert' who declares that there is no instance on record of a line-of-battle ship having been taken by boarding? Whoever is responsible for this rash statement must be grossly ignorant of the life of Lord Nelson, and of the capture by that heroic little captain of two-line-of-battle ships *by boarding* in the famous fight off Cape St. Vincent.

## IV.

THE average life of a wooden ship was said to be fifteen years. This probably was assumed as a basis for insurance purposes, yet a large percentage of wooden ships flourished much longer than fifteen years. I could quote many instances of wooden ships which kept afloat an incredible number of years. And eighty out of every hundred were coasters. Mostly coasters were called sea-coffins after Mr. Plimsoll started up in the House of Commons, and theatrically and effectively denounced the shipowner as the rapacious destroyer of his species; so the quaint old sieves went in their dozens to the marine knacker's yard, and a hundred objects of interest to a nautical or a painter's eye disappeared for ever from our home waters.

Two extraordinary instances of longevity in ships may be worth quoting here. In February 1827 the 'Betsy Cains,' of Shields, sailed from that port with a cargo to Hamburg. She met with a heavy gale from E.S.E., and bore up for Shields harbour. The sea was raging on Tynemouth bar; the ship struck, was driven upon the rocks and lost. What ship was this that was lost in the year 1827? Will it be believed that she was the yacht that in 1688 brought over to England William, Prince of Orange, and that she was then called the 'Princess Mary'? This, at all events, was claimed for her. How old was she when she carried the Prince? For a number of years afterwards she was one of Queen Anne's royal yachts, and was reckoned a very fast sailing vessel.

The other instance is that of a vessel called the 'Cognac Packet,' which, as she was afloat in 1886, may still be trading and in good health. I took a note of her in that year, when she sailed from Seaham harbour coal-laden for Harwich, in

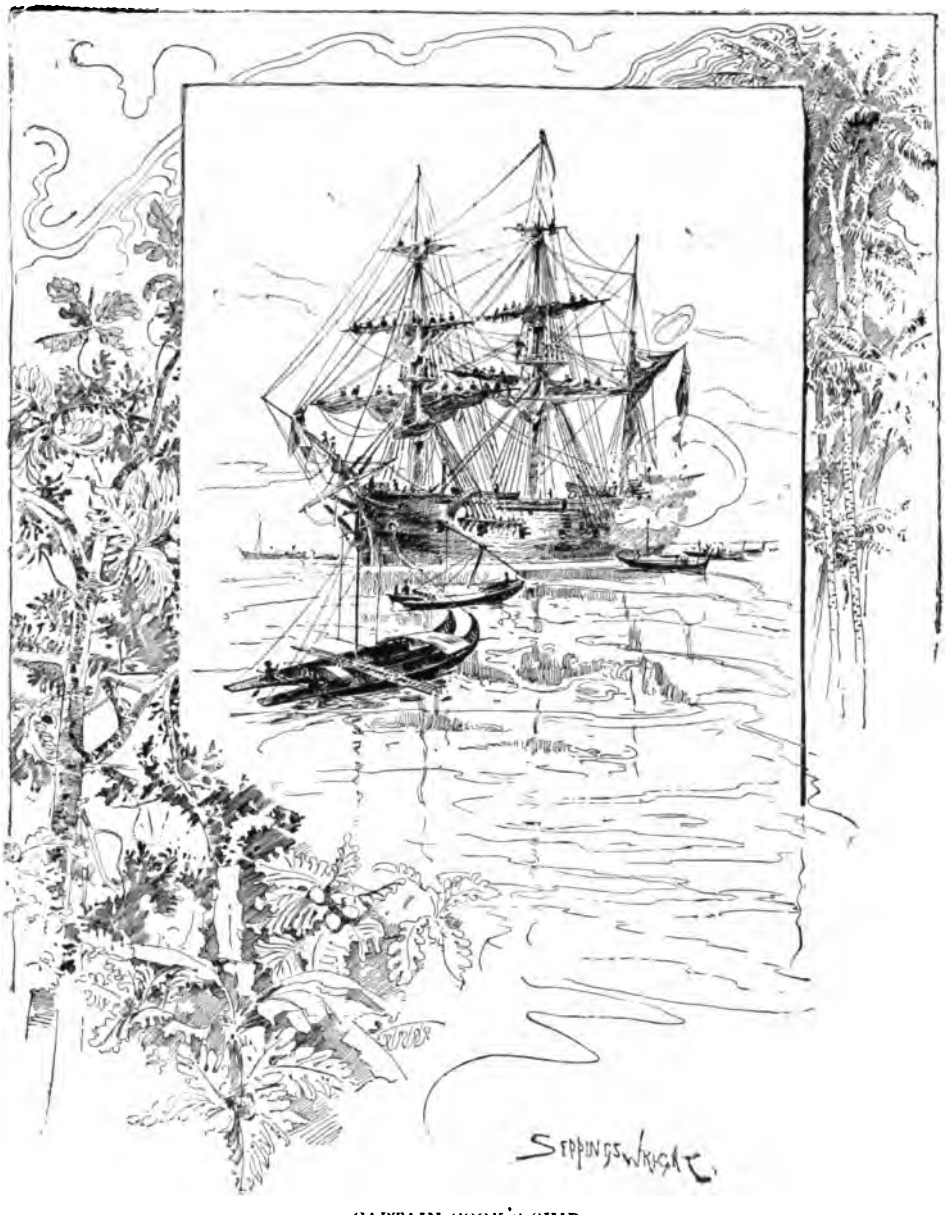
HUDSON'S 'HALF-MOON'

command of Captain Button, and she was then ninety-four years old, having been built at Burlesdon, Hants, in 1792. She used to carry brandy to France, and so they named her as above. She was almost a box in shape.

The old ship that went to pieces off Shields, and that Queen Anne used as a yacht, finds a certain similitude in our artist's sketch of Henry Hudson's 'Half-moon'—a yacht (as she was termed) of eighty tons, manned by fourteen or sixteen people. In such small fabrics did the brave hearts of old sail forth to dare the terrors of the Frozen North, or to search for new lands beyond seas then measureless to man. In far later times the heroic Cook set out on his voyage of discovery in ships not greatly superior in bulk, build, or equipment to the 'Betsy Cains.' The 'Discovery,' one of Cook's ships, was sketched by E. W. Cooke, R.A., as she lay on the mud with a flight of prison linen blowing from a single mast. She is a convict hulk, but her lines are perfectly clear, despite many structural alterations, and it is noticeable that in this ship, which serves as a type, no progress in form is discernible. She is as much a tub as any Dutchman of the seventeenth century. The swell of her sides so overlaps her run that she appears to have shown nothing aft under her counter but what the the shipwright would call dead-wood.

In fact—though I suppose I shall not have the shipbuilders with me—we had to wait for the Americans to build to appreciate the meaning of fine lines and keen entries. We were a long while in learning, and it was not until our pockets were threatened that we took the hint. Yet so long ago as 1769, the Americans (we then called them 'the Colonials') built and launched 113 square-rigged craft and 276 sloops and schooners. The black slaver was afloat, British speculators greedily engaged in this trade, and an example of British humanity may be found in the following dimensions of an English slave-ship hailing either from Liverpool or Bristol. She was 100 ft. long, her breadth was 25 ft. 4 in., height between decks 5 ft. 8 in. She is described as frigate-built, with-

out forecastle, and pierced for twenty guns. In addition to her crew she is said, on one occasion, to have carried in slaves 351 men, 121 women, 90 boys, and 41 girls, a total of 603



CAPTAIN COOK'S SHIP

negroes! This would be considered a considerable company of souls for an Inman or a Cunard steamer, and here were all these people packed on board a vessel one hundred feet long.

In course of years, when the slaver was hunted down as the pirate was, the need of speed produced a form of hull that, if we may credit old seamen, came as near to perfection as the art of the shipwright can reach to. All readers of 'Tom Cringle's Log' and 'The Cruise of the Midge' must remember Michael Scott's enthusiastic and delightful description of the slaver of his day: the low, long, black piratic hull sheathed with gleaming copper to the bends, schooner-rigged, and lifting enormous heights of canvas for a vessel of her size. But then there was the Middle Passage to be made and the cruisers to outrun: fifty days from the Gold Coast to the West Indies was considered an average passage. The run was sometimes made in forty-two days, and this was considered good. The vessels floated into roasting calms. Think of the misery of the slaves confined in the hold—babies, mothers, men, boys, and women—dying amid filth, in an atmosphere horrible to smell, in which a flame might hardly burn. As the wretches died they were flung overboard.

> 'We'll have the niggers up, my boys,
> And fling them in the sea!'

runs the old song; and it is a fact, but one of the blackest of the facts of that hellish trade, that when slavers were chased by men-of-war, negroes were hurled into the water, not with the intention of lightening the vessel, but that the spectacle of the drowning wretches should appeal to the humanity of the pursuer and compel him to stop chasing to lower his boats.

Whilst Canada was under the dominion of the French, a

sixty-gun ship had been constructed of the red pine of that country. This was perhaps in the recollection of our Government, which, when Canada became a British dependency, recognised the expediency of encouraging emigration with a view to the cultivation of hemp and timber. 'The timber trade alone,' says Lindsay, 'sufficed to tempt many enterprising Englishmen to strain every effort to open out the vast regions comprised

A FRIGATE

under the names of Upper and Lower Canada.' But it is to Boston and Salem, or rather to the State of Massachusetts, that we must look in the last century for developement of form, proportion, and general beauty in ships. The Americans are no longer a ship-making people.[1] How their shipwrights would manage in the expression of finer types than we ourselves have developed in this age of iron can only be conjectured; it is

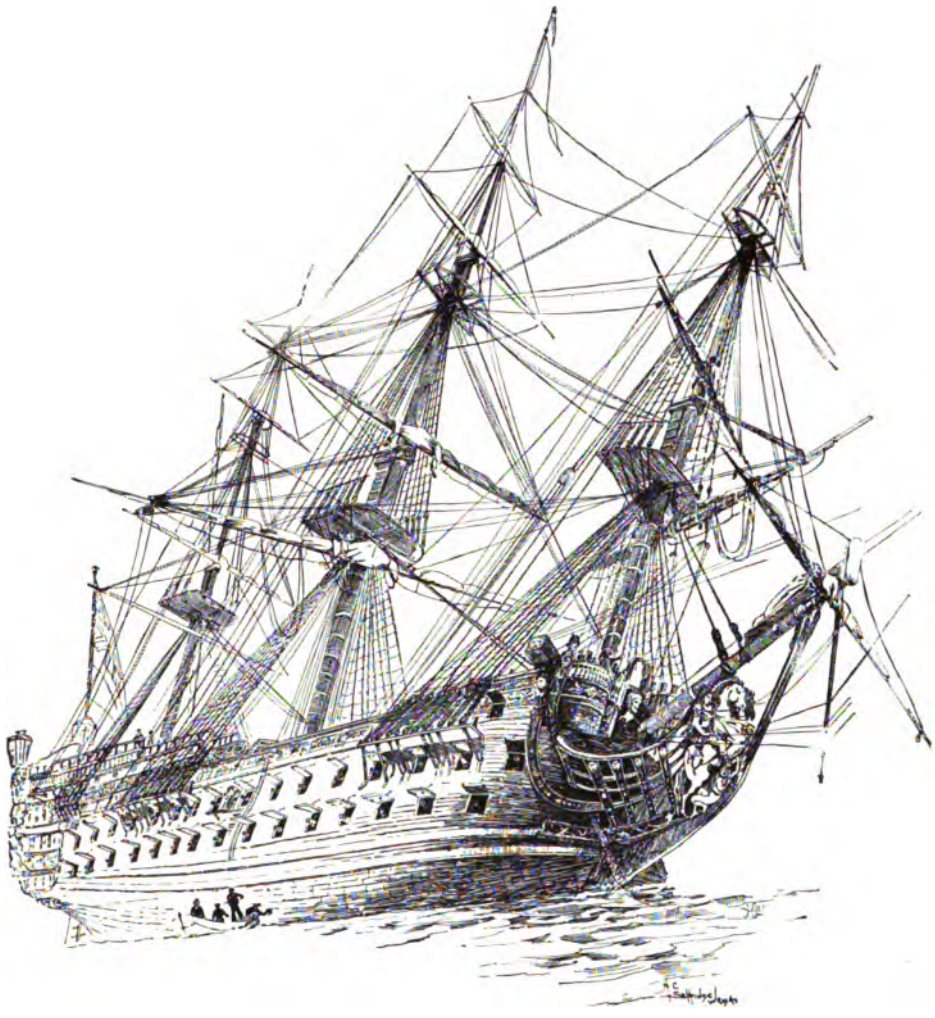
[1] I modify this statement in 1899.

certain that we owe them many suggestions. Indeed, for the matter of that, we have ever been a hint-borrowing race—when the hint has been washed to our doors. 'We fetched the first model and pattern of our friggots from the Dunkirks,' says old Fuller; and Pepys informs us that Pett 'took his model of a frigate from a French ship which he had seen in the Thames.'

James, who is the best authority on all matters connected with the Royal Navy of the days of Howe and Nelson, in a preliminary treatise refers to British appropriation of foreign ideas in shipbuilding. He admits that in the form of the lower body of their ships the French greatly surpassed the English; but he contends that, in point of materials and workmanship, the advantage was, and down to James's day still was with the latter. He owns, however, that in 1750, and for long years afterwards, many complaints were to be heard in the Navy against the inadequacy of the scantling of ships for their freight of artillery. 'Our ships are born too weak,' the sailors used to say. As to the inferiority of the materials used by the French—have I dreamt, or is it a fact, that some of the very finest vessels in our Navy were prizes captured from the squadrons of France, and that it was by their models we improved our own ships?

Indeed, as an example of the quality of the structures our builders of the last century were turning out for the hearties of the pigtail to risk their lives in, take this statement of William Hutchinson, a mariner, who was a dock master at Liverpool, and wrote a book on practical seamanship, the fourth edition of which, printed in 1794, lies before me. 'About the year 1755,' he says, 'I went to Chatham, where I observed the "Royal Sovereign," a first-rate ship-of-war, in the repairing dock, laid upon blocks that formed a convex curve, about two feet higher under her main frame than at each end of her keel, in order to

suit her concave hogged bottom, which I reckon was owing to being built by the long, straight floor, which great defect by



THE 'ROYAL GEORGE'

all possible means ought to be avoided, by building ships with convex elliptical curved bottoms in their length downward.'

A ship is said to be 'hogged' when she has so strained the middle of her hull that the stern and bow droop. The hog's

back seems obviously to have suggested the expression. Old Mr. Hutchinson brings another charge, which had not probably met the eye of the late Mr. James. He says: 'An intelligent Chatham gentleman, who had been thirty years master of our ships-of-war coming to Liverpool, called upon me. I showed him the above paragraph relating to the "Royal Sovereign." He immediately observed that this was accounting for the report of a crashing noise that was heard when our large ships-of-war were put upon straight blocks, which must naturally be owing to their being hogged, which I reckon begins from the time of their being launched.' Some years later, Collingwood was unconsciously justifying this statement, by complaining of many of the ships under his command behaving as though they were hogged. Of all sea-leaders Collingwood deserved to get the best ships. It was he who filled his pockets with acorns when he was at home, and dropped them as he walked about, trusting that they would spring into oaks proper to build ships to beat the French with, long, very long, after he should have become a portion of the soil they drew their life from.

It seems difficult to find any improvement of a marked form between the ships of the Charleses and the ships of George III., down to the close of the last century. I do not refer particularly to vessels of the State, nor to the internal fittings and strong fastenings of ships. The merchantmen remained mere butter-boxes, many of them gaudy indeed with colour and gilt, but slow in sailing and heavy to handle. They were overbowed. Then, again, their 'buttocks,' as the old shipwrights very properly called the 'run,' carried a mass of dead water with them. It was like having a ship in tow, and they were steered with difficulty. The shipwright tried his hand at what was called full bows and clean tails—to no purpose. These

ships, instead of dragging the water after them, heaped it up before them, and stopped themselves; and even in moderate weather the wheel was going up and down as though the vessel was amongst ice. When running, they easily broached to, and if they did not broach to, they were pooped.

Again I must refer to the rolling of those old ships owing to their proportions; and what their proportions were we may gather from a writer who speaks with a note of alarm 'of a very extraordinary sharp, slight ship' that was *only* twenty-seven feet beam to eighty feet keel! What would the old builders have thought of an iron ship—I will not say of an iron steamer—of to-day? It is not long since that at Gravesend I watched a large four-masted sailing ship moored to a buoy swinging with the tide. As she swung stern on, bringing her masts into one, I could scarcely credit my sight. As much of her as was above water was wall-sided. She sat like a long, very narrow straight plank, supporting a grove or wood of spars and yards. Certainly she promised no very great width of pinion. Yet such a vessel as this, ill-stowed, under-manned, without an inch of swell of side to help her when depressed to port or starboard, does yet manage somehow to wash about the ocean; and though no doubt many of them founder, a large percentage make their appearance with more or less punctuality, probably to the secret annoyance of the well-insured owners.

Such an iron ship as I have described will not roll; she lists if her cargo shifts, and then as a rule, if her men cannot trim her, she sinks. Now, the old ships *rolled;* they brought everything aloft into the wind's eye: though hove to, they swept their spars almost as far to windward as they inclined them to leeward. The cry of 'Stand from under!' was constant; down would come the main-yard upon the deck, the jeers or tackles with which in olden times they hoisted the courses hav-

ing parted; crash would follow a topmast; away would go the jibbooms, and with them the fore-topgallant mast. By and by nothing might be left but a hull, with perhaps the mizzenmast standing and a distress-colour flying in the rigging.

BARBARY FELUCCA.

A happy mean was wanted—something between crankness and stiffness: it was long in coming. It is strange that those

old builders should have refused so long and so sullenly to make any effort to solve the problem of length, beam, and depth. They grasped the hint when the model was a prize or a wreck arrived on these shores; but it does not seem that the commercial shipbuilder ever took the trouble to roam abroad for ideas, or surely a revolution in structure would have happened long before the date of the launch and flight of the first of the superb China clippers.

The Maltese were building finely lined craft; the builders might have gone to Venetian waters for ideas; the yards of old Spain and of the Mediterranean seaboard should have proved fruitful in hints. But the spirit of roast beef was too strong: the builder's father had built just like that before him, and what they called improvement was his abomination. So tall fabrics, so broad that at a distance you knew not whether they were beam on or end on, continued to tumble about the ocean. No doubt what Charles Dickens would have derisively called 'tonnage' weighed as an oppressive influence upon the builder. A ship's capacity was formerly got at by calculating her tonnage for measurement by half the breadth for the depth instead of the whole depth. This was the requirement of the owner: he demanded disproportion in order to gain more stowage-room and accommodation for passengers and crew. In vessels thus put together a captain made nothing of sailing with his lee windlass-end under water.

A ship was built, much about the year 1780, which was said to have satisfied everybody all round. I submit her dimensions for the information of those curious in such matters. She was 360 tons by what was called carpenter's measurement; her extreme length of keel from forefoot to keel at the after-part of the sternpost was ninety feet; her extreme breadth at the main frame was thirty feet; her depth from the ceiling to

the main deck was six-tenths of the extreme breadth, and the rake of the stem was formed so as to admit the wood-ends of the entrance and bows to make the same curve as the water-line from the stem at the harping towards the main frame; whilst the bows flaired out with the rake of the stem till they were formed by the sweep of a circle of half the main breadth amidships. The wright who built her describes her with solemn satisfaction; everybody was delighted. She was called the 'Hall'; yet no smack ever launched anything

INDIAN RAFT

through her gangway more tub-like and unlovely in the shape of a deck-boat than this same 'Hall.'

It may interest the reader, perhaps, if I refer briefly to the sails which ships were carrying in the last century, at about the period, let us call it, when the 'Hall' was washing away to leeward on a bowline with her well-pleased builder at the hardover tiller—say, 1760 to 1800.

I am looking upon a plate of a ship under all sail, and I count in all thirty-one, without studding sails. This ship,

VENETIAN GONDOLA, UNDER SAIL

belonging to the year 1794, carries under her jibboom and bowsprit a spritsail and spritsail-topsail; she has royals; she has an extraordinary tall hoist of topsails, which laughably shrinks her topgallant-sails; she has three jibs, and a fore-topmast staysail. In addition to the sails still in use, she carries a water-sail, hauled out to a tail-block made fast to the driver (or spanker) boom-end. At the extremity of the spanker-gaff they hoisted a great lug-shaped sail. Saving these and the spritsails, I witness no other changes than these: first, that the royals of the old ship (then called the topgallant-royals) were mast-headed by sheaves in the trucks; next, the stay on which her mizzen-royal staysail is hoisted appears to be set up midway the main-topmast—which I confess I do not understand, since it would be impossible for the main-topsail yard to come down on the cap with that stay direct in the road of the parrel. Otherwise the changes are exceedingly few. We now halve our sails, and call them double topsails and topgallant-sails, with great disadvantage to the speed of the ship, one should say, for by this splitting or halving process much of the power of the wind is lost. The studding-sail also, I believe, is practically out of date. Yet I venture to say there is no living sailor who, if he could go on board that old ship, would not find the complicated machinery, aloft and alow *almost* as familiar to his hand as the gear of anything in iron now sailing out of dock. I observe that the crossjack yard, which formerly in old ships made a lateen-sail of the spanker, closely resembling the sails of the Barbary felucca the artist has drawn, is square by lift and brace in this old ship.

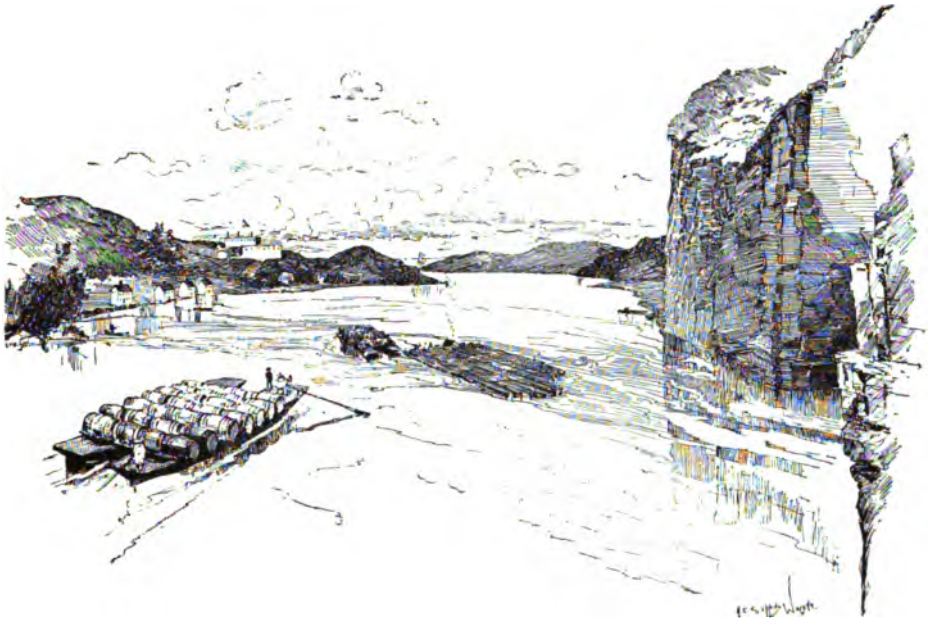
It is worth noticing here, however, that, if the mariner of the last century had progressed in sail-making, though not in naval architecture, he was still very poorly equipped by science as a navigator. Down to the times of Maskelyne and the Board of

Longtitude, the seaman relied on dead reckoning for his longi tude. Splendid were the efforts made to solve the problem. Irwin invented a marine-chair to observe Jupiter's moons at sea; Harrison furnished his famous time-piece, which made the voyage of trial to the West Indies. A board of Longtitude was established, and Mayer's Tables and Maskelyne's Nautical Almanac were issued.

The Nautical Almanac was viewed for long with alarm and distrust by the old race of seamen; they feared that their discovering the longitude by it would require such nice observations and such long calculations as must result in the most dangerous errors; so they went on heaving the log. 'The Board of Longtitude,' wrote an old sea-captain, 'in order to facilitate the discovery that is expected to be made by this last mentioned method' (*i. e.* the Nautical Almanac), 'has ordered that the masters for the Royal Navy must qualify themselves by learning to pass an examination to show that they understand the Nautical Almanac, which is a task, in my opinion, that cannot be expected from many of our most hardy and expert navigators, whose education has been mostly, from early youth, through the hard, laborious, and busy scenes of life at sea, and who have never had the opportunity to get the learning that is necessary to understand the true principles of the Almanac.'

There never yet was a good thing introduced into the sea life but that old sailors with faces of fire objected and protested. The double topsail yard, for instance, was the invention of an American. In one of the old 'Nautical Magazines' there is a sketch of a United States auxiliary frigate rigged with double topsails—the first ship (I believe) that adopted them. Though, as I have elsewhere said, the double topsail cannot possibly hold as much wind, and therefore do as much work, as the old-

fashioned single topsail, yet a no more serviceable idea ever entered the human head. In an instant, by letting go your upper topsail halliards, your ship is under close-reefed sail. In my time it took the whole strength of a watch to reef a topsail in anything like a fresh breeze. The halliards were let go, the sail blew up in huge bladders iron-hard, the reef tackles were roused out; *then* began a job that would often run the watch into the best of an hour, what with waiting for the



AMERICAN CATAMARAN

weather earing to be passed and then 'hauling out' to leeward, with the ship perhaps almost on her beam ends, and the sight blind with the flash of rain squalls. This is ended. But what did the old Jacks say when the double sail was introduced? 'Oh, yes,' they growled, 'we understand all about them novelties. They're meant for the benefit of us pore sailor-men, of course. Why, durn them double yards! ain't they going to give the owners an excuse to cut down the number of the crew?

They'll profess that half the usual number of a ship's complement will be enough to sail a ship that has them double yards.' They objected to wire rigging. It was without elasticity, they said; it imperilled the mast; shrouds of metal could not be cut away like the laniards of other days. There is no bigot like a sea-bigot, and amongst the reasons why the progress of naval architecture was slow down to the age of steam you may include the prejudice and ignorance of the sailor.

The real miracle of the ship of all times must lie surely in her navigation. One implement of the old-fashioned mariner, nevertheless, remains—I mean the reel-log. This is a reel with a quantity of line wound round it; lengths are measured off, and marked by knots. The sand-glass is turned when the piece of wood at the end of the line is thrown over, and the 'stray line' paid out, and when the sand is run out the line is arrested, and the knot the nearest to the hand shows the speed of the ship.

This simple method of measuring speed is probably as ancient as the art of navigation itself. Yet, though this old log has been supplemented, it has never been replaced. It is still as regularly 'hove' now as in olden times, when they were finding out their longitude by it.[1]

But how much better off, I wonder, is the sailor of these times than was the mariner a hundred and fifty years ago? The other day a gentleman put into my hand a telescope which he said had belonged to Nelson. The owner (a retired naval officer had particular good reason for knowing that the glass had been Nelson's. It was a long, awkward tube, and when I put it to my eye methought I saw more, and certainly clearer, with the naked sight. It is an engine—it is as big as a

[1] It ought to be regularly hove by every deep-water ship. If I commanded a ship I would not place my whole dead-reckoning trust in Massey's or Walker's log.

blunderbuss—which fairly illustrates the machinery at the disposal of the old navigator. His fore-staff was a very rude contrivance, and the quadrant that science (after keeping him waiting for it for years) at last put into his hands might provoke the mirth of the most serious for its primitive plainness and lumbersomeness. What has the navigator now which the commander of the ship of old had not? His sextant is a perfect and beautiful instrument, his chronometer is a timepiece of exquisite accuracy. Thanks to the admirable genius of Lord

AN INDIAN BALSA

Kelvin, he possesses a compass which is the best of all compasses to steer by. To Lord Kelvin, too, he owes a sounding machine, by which he can tell the depth of water his ship is in, though she should be steaming as fast as a gale of wind. He has an instrument for indicating the number of degrees his ship rolls to, how her cargo is trimmed, what her list is, whether she is down by the head or stern. With the modern captain's telescope Nelson could have determined many faces, and even the expressions of them, on board the vessels of the Combined Fleets, when his own perspective glass gave him nothing but

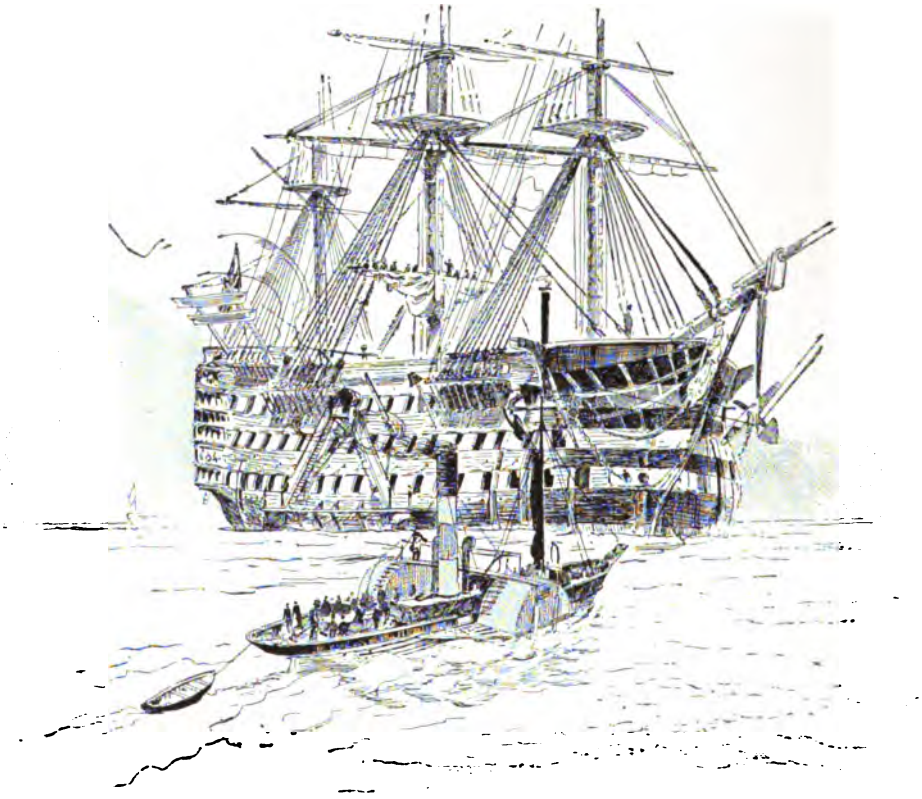
a line of ships nodding small upon the horizon. The mariner should not easily miss his road in these days. He has no excuse to run into islands, or to produce a reckoning which, if it were right, should place his ship forty miles up-country in Africa.

Yet somehow or other, though the old seaman went to sea most shabbily furnished, he managed to grope his way about the world with little loss except of time. It is his spirit that makes a wonder of his little ship. As she floats up the Thames, trailing with her the weeds and grass of distant seas, we salute the sturdy figure that stands upon the lofty poop. He may be a very obstinate old fellow, mutineering against every suggestion calculated to facilitate his dangerous labours, but he has carried the flag that flies over his head round the world by methods so crude and primitive that we are moved to astonishment and admiration as we survey him in fancy. The ship reflects his splendid spirit, and by its informing essence, clumsy old wagon as she may be, she is made beautiful to the eye of imagination.

## V.

THERE was never a finer ship afloat than the East Indiaman, from say 1800 down to the last of them, such as the 'Earl of Balcarres.' Cooke sketched the 'Thames,' one of the handsomest, *circa* 1820. She has the lordly look of a man-of-war as she floats off from the wind on the slant of a sea; she wants nothing but a pennant. Those old East Indiamen were exceedingly comfortable ships—liberally found and handsomely furnished. It is a question whether passengers grew more weary of the ocean after four months' salt water to Bombay and Calcutta, than do travellers in these times after six days of the Alantic, or a little more than a month to New Zealand. We often pull out our watches as we rush along in a railway train; in the old stageing days they were content to note the hour by a leisurely glance at the clock of the inn where they baited. People of old, when they went to sea in an Indianman, knew what they had to expect. They danced, flirted, sang, talked scandal, quarrelled and made it up, and often the young people got engaged to be married. All the after-part of the ship was a villageful of people more or less good-humoured. Many are still alive—they are no longer young—who remember that old-fashioned voyage round the Cape to the East: the old cuddy, the griffin, the ayah, the eternal brigadier with his majestic whiskers. She was by no means lost to sight when John Company hauled down his flag. The East and West India Docks grew full of her, at least of ships which, in regard to

burthen, stateliness of appearance, sumptuousness of cabin fittings, were well worthy to be the Indiaman's successors. No finer set of ships in the days of wood ever sailed out of the Thames than some, indeed most, of the vessels of the fleets which flew the house-flags of Green, Dunbar, Wigram and Smith.



H. M. S. 'BRITANNIA'

The repeal of the Navigation Laws curiously and unexpectedly stimulated the shipbuilding industry. Their repeal excited great consternation at first. Many owners resolved to sell their ships; others to register under foreign flags. The date of the repeal was 1849. These laws had been in force for nearly two centuries. They had been designed to arrest the

maritime progress of Holland; they had rendered the apprenticeship system compulsory; they provided for a nursery of seamen, whether shipowners liked it or not, such as we should find it impossible, without the re-enactment of these laws rigorously enforced, to establish in this age, when the foreigner, or 'Dutchman,' is rapidly taking the place of the English seaman.[1]

Immediately on the repeal the United States went to work to secure for their shipowners the trade Great Britain had thrown open to them. It is true that some years earlier than the date of the repeal of the Navigation Laws there had been competition (but of no severe sort) between British and American owners in the China trade. In 1845, clipper ships of a novel and beautiful form, outsailing ours by two feet to one, were despatched from New York and Boston to Wampoa. They were low in hull, had great beam, their lines were exquisitely fine, their yards were extraordinarily square, and any one of them showed as much canvas to the breeze as a line-of-battle ship. We opposed them with a single clipper-schooner as a 'test.' She was named the 'Torrington,' and she was built by Hall of Aberdeen. She was watched, and on her proving a commercial success a few others of larger tonnage were launched.

And still the Americans went on building larger and faster ships. Gold had been discovered in California, and this communicated a wonderful impulse to shipbuilding in the States. American ships sailed from California to China and loaded produce direct from London to New York, and they received as much as 10*l.* per ton freight. The British ship, on the other hand, was not earning half this money. It looked at

[1] I desire, without egotism, to place on record the University of Durham's and my own efforts in that patriotic journal, 'The Morning Post,' on behalf of 'Mercantile Jack,' which resulted in a petition three-quarters of a mile long to the House of Commons. (1899.)

one time—and that was in 1850—as though the commercial flag of the United States were destined to drive the red flag of our country off the seas. How things would have gone with us but for the transmutation of the ship into a metal the soil of our country was full of, is a question it is now idle to ask. But assuredly the repeal of the Navigation Laws, supple-

A BLACKWALL LINER

mented by the amazing and brilliant activity of the Americans, started the British owner out of his mood of bilious apathy.

There was no good, he considered, in continuing to view things with a gloomy eye. So first of all that well-known firm, Messrs. Jardine, Matheson & Co., commissioned Hall of Aberdeen to build a clipper ship for them. She was named the 'Stornoway,' and was the mother of the beautiful fleet of

Aberdeen clippers. Others soon followed. In a famous race in 1856 the 'Lord of the Isles,' built at Greenock, beat two of the fastest Americans. They were nearly double her size; but she was the first, nevertheless, in the delivery of the season's teas from Foo-Choo-Foo.

From this it will be gathered that the Americans were our very good friends in suggesting, by their commercial antagonism, such perfect fabrics as those of the Aberdeen clippers. I knew them well when a lad at sea. I was in a fast ship from Australia; yet one—I think she was the 'Wooloomooloo'—in a fresh breeze overhauled us hand over hand. She broke the brine into smoke; her green side swept shark-like over the surge; she would lean to her wash-streak in the trough with the weight of the wind in her lofty, superbly-fitting sails; and she showed a forecastle and waist flashing with wet. She went past us like steam, though our own wake was a white road to the horizon, and she made me a memory I shall never forget.

It is half a century ago since a great transformation scene in the wonderful drama of the ship was enacted, for in that year a voluminous Merchant Shipping Act was passed, a ponderous Act of 548 clauses. I cannot stop to talk of this Act beyond saying that it had a direct influence on the building of the ship. In the second part of the Act a new measurement for tonnage enabled a shipowner to construct vessels suitable to his trade. It determined the dues leviable on ships according to their loading capacity. It provided for certain conditions, which did not nevertheless hamper the owner or shipwright in his choice of shapes. The object was to ensure safety, and the Act required water-tight compartments, boats, and much other furniture.

Prior to the passing of this Act the average ship—that is, the ship not built for any special work—exhibited in her lines

something of the old traditionary squabness and lumpishness which you notice in the hull of the 'Terror,' as she rolls with her consort off great icebergs, Some of the frigate-built ships of the Merchant Service preserved this look of the 'Terror.' I sailed in one of them (she was called the 'Hougoumont'), and, saving the steeve of the bowsprit and a few trifling details aloft, she would have perfectly served the artist as a model for the 'Terror.'

To a certain degree the sailor is benefited by the structural changes wrought in the ship during the past fifty years. He is now, for the most part, sheltered by a tolerably roomy deck-house, with windows for light; and some owners are even so generous as to provide him with a table on which to cut his hard junk and beat the worms out of his biscuit.[1] Formerly, in the timber days, if the ship was flush-decked, Jack and his brethren dwelt in a black and noisome hole right forward under a little hatch. If the ship was a wet ship, this little hatch was closed to prevent the fo'c'sle from filling, on which occasions the flame of the slush-fed lamp burnt blue. The men could scarcely see to read, or stitch, or cut up a piece of tobacco for their pipes. Their malodorous fare was handed down to them in tubs, and they got their dinner as best they could, by jabbing at the contents of the tub and carrying a bit away as if they were dogs; and often they wanted tin dishes, and used a biscuit for a trencher.

If the ship carried a topgallant-forecastle, the sailor slept in a cave formed by this raised deck. The windlass blocked his view of the prospect aft. The interior was only a little less dark, and just a little less wretched, than the miserable den under deck. The shipbuilder has helped Jack in this matter. But it

[1] Nevertheless, the under-deck forecastle is still very common in steam tramps and sailing ships.

THE 'TERROR' AMONGST THE ICE

is unaccountable that the foremast hand should have been for centuries utterly unconsidered by his employer, and treated as if he made no part of the ship at all. Why was this? Is the crew of a ship useless on board of her? What can the owners substitute for men? Not yet has the inventor charmed us with a piece of mechanism which, when wound up, shall run aloft, shall reef and steer, and shall not keck at salt pork because it shall never know hunger. That the British sailor has been, and to a shameful extent still is, the most neglected, and in consequence the most ill-used, of all men, I have been saying all through my professional life; and this, I fear, I shall have to go on saying till my hand lies cold in the soil.

British steam swept the Yankee clipper off the seas; oceans of canvas and hulls of faultless mould could not prevail against the diligent slap of the side-wheel or the secret thrust of the propeller. Nevertheless, the Americans had made a very noble stand. It was only when they found their shipping almost unremunerative, owing to the heaps of tonnage which lay idle upon their hands, that they gave up. Fleets of ships had been built in the Californian rush, and for the Californian trade, between 1849 and 1854. One of the finest of these was the 'Great Republic,' the earliest four-masted ship—properly so called. Her burthen was 3,400 tons, though she was launched to register 4,000 tons; she was 300 feet long, 53 feet beam, and 30 feet depth of hold; she carried a donkey engine of 8 horse-power for working ship, and for loading and discharging purposes. She thrashed from New York to the Scilly Islands in thirteen days. The French Government chartered her as a transport for the conveyance of troops for tne Crimea; otherwise, being thought too large for ordinary purposes, she must have remained long on the hands of her consignees.

At the date on which I am writing these articles it is entirely the other way about as regards size; the orders given are for very large ships.[1] A gentleman writes to me, from a well-known Tyneside shipping yard, that in 1875 the average size of sailing-ships ran from 1,000 to 1,800 tons, and steamers from 1,000 to 3,000 tons; and to-day (1895) sailing ships run from 2,000 to 3,000 tons, and steamers from 3,000 to 12,000 tons. Nevertheless, the 'Great Republic' would be considered a big ship even in this age.

I cannot but refer here to a superb type of clipper ship built

A DEAL GALLEY PUNT

in British yards and sent afloat between 1860 and 1872. As ocean going ships they had never been, possibly they never will be, equalled. They had the speed of steam in their nimble keels. Amongst these ships were the 'Fiery Cross,' the 'Ariel,' 'Sir Lancelot,' and the 'Thermopylæ.' This last ship made her first voyage from London to Melbourne in sixty days—the

[1] *Vide* the 'Oceanic.' The very big ship is a very big blunder, the offspring of competion and not of progress. When an 'Oceanic' sinks she carries with her the value, and perhaps the lives, of four comparatively small, but swift, safe, and commodious steamers.

fastest passage on record. She is still afloat, I believe. A few years ago I saw her at anchor in the Downs, with the inevitable Deal galley punt loafing under her quarter. She had a racing look in her lofty rig, and her cutwater at the entry came rather abruptly aft, much in the fashion of the stems of the yachts they build in these times. I did not admire this feature, but I judged it was good for the ship. She, like many of her sisters, was a composite vessel—that is, her ribs were of iron and the rest of the hull was formed of wood. It seems proper to state here that this beautiful and memorable ship was designed by the late Bernard Waymouth, for many years secretary to Lloyd's Register.

There was plenty of spirit in racing amongst the clippers in those days. They were mainly tea-ships; and in one famous race three sailed from Foo-Choo-Foo on the same day, lost sight of one another until they met in the English Channel, and all three sailed up the river Thames almost upon one another's heels. In connection with these races it is related that an English clipper named the 'Crest of the Wave' and an American clipper named the 'Sea Serpent' sailed together from Shanghai for London. The Yankee was to receive thirty shillings per ton extra freight on his cargo of tea if he beat the 'Crest of the Wave.' The ships arrived off the Isle of Wight at the same hour, and the American skipper, going ashore, started by rail for London, and reported his ship at the Custom House before she and her rival had passed through the Downs. This, that American skipper might have thought 'cute; but it was not racing. Why did he take the trouble to sail his ship all the way home? He might have handed the vessel over to his chief mate to navigate to the Thames and taken steam to London where he could have reported the 'Sea Serpent' to the Custom House when she was off the Cape of Good Hope.

The story of the use of iron as a material for the construction of ships is full of interest. Iron was long ago used experimentally for building boats; several references to these crude

A 10-GUN BRIG

attempts will be found in the 'Annual Register' of last century. Grantham quotes from a publication dated July 28, 1787. The writer says: 'A few days ago a boat built of English iron by J. Wilkinson, Esq., of Bradley Forge, came up our canal to this town, loaded with twenty-two tons and fifteen hundredweight of its own metal, &c. It is nearly of equal dimensions with other boats employed upon the canal, being 70 feet long, and 6 feet 8½ inches wide; the thickness of the plates with which it is made is about five-sixteenth of an inch, and it is put together with rivets, like copper or fire-engine boilers; but the stem and stern posts are wood, and the gunwale lined with the same; the beams are made of elm planks. Her weight is about eight tons; she will carry, in deep water, upwards of thirty-two tons, and draws eight or nine inches of water when light.' It is extraordinary that such hints as these should have fallen dead. Was there no shipbuilder with an eye swift to witness the enormous possibilities latent in these little canal experiments? A small iron boat was launched in August 1815. She was fitted up in Liverpool as a pleasure-boat. Hundreds viewed her as a curiosity. She was sunk maliciously in the Duke's Dock, as though some Daniel Quilp of a workman, foreseeing iron as an issue if this boat was suffered to go on hinting, had put an end to her. Her owner raised her, and sold her for old iron, but 'the loss of this boat,' he says, 'turned my attention to the practicability of making an iron boat which could not be sunk by any ordinary means.' He constructed a model of a lifeboat, and applied for a patent for her in April 1818. She was to be built wholly of iron, and to possess remarkable buoyant and self-righting properties. This gentleman, whose name was Jevons, came into the world, strictly in a shipping sense, about forty years too soon.

Meanwhile in the Royal Navy, down to the iron age, and

long after, ships of the sort which Nelson and Exmouth had commanded were very much afloat. The ten-gun 'pelter' was in existence, occasionally going down stern foremost. For years and years a nautical eye might have found it hard to detect any structural alterations or improvements in frigates or line-of-battle ships. Here and there a round stern with guns showing; here and there a square stern magnificently finished, with mouldings, windows, quarter-galleries, and the like; but the line-of-battle ships, the frigates and the corvettes, the brigs and the cutters, remained as though there was never to be a change. The liners all looked like the 'Victory.' Lord (then Mr. T. H.) Farrer, of the Board of Trade, speaks of one of his colleagues in 1850 as Admiral Beechey, an officer of intelligence who had been largely employed in surveying, and was well acquainted with steam-vessels. Yet this same gentleman declared that he did not believe the Navy of the future—the Royal Navy—would ever be built of iron and driven by steam. Nor could he endure iron ships. 'It was a very few years after this,' says Lord Farrer, 'that, in company with him, I witnessed one of the most beautiful sights of my life—the Naval Review at Spithead in the first summer of the Russian War, when the last four sailing vessels of the Royal Navy formed the attacking squadron. I shall never forget the beauty of the scene, when late in the afternoon these magnificent ships came on with a gentle breeze from the east, and the descending sun shed a dying glory on their towers of canvas. It was a fit obsequy for the hearts of oak of Rodney, Howe, and Nelson.'

This is very eloquently said; and the sigh in it, the regret, the last fond, lingering look behind, touchingly illustrate that sort of official hate of change which found expression in British *wooden* battleships *in tow* when the ocean was already covered with iron commercial steamers. What would the heroic James Cook

A RAMSGATE SMACK IN HEAVY WEATHER

have thought, if not said—Cook of the hung head and scowling brow, Cook our island's darling circumnavigator—what would Cook have thought had he returned home from his first voyage, and, learning that steam had been applied to navigation, asked for a steamer and received this official answer: 'No; it is true that the steamer is in existence, but we do not choose to recognise her. For centuries we have managed very well with tacks and sheets; you have blown round the world very comfortably, we make no doubt, in your ship, the health of whose crew does you credit, whilst we cannot but own we are much pleased with your discoveries'? I can see that Whitby sailor spit as he walks out of Whitehall. Why is it that those who have the administration of the marine affairs of the greatest maritime Power in the world always lag in the rear, look stupidly and dimly as through coloured glasses at novelties, break the patentee's heart by cold rejection, and start at last out of a grandmotherly doze at the note of the war-blast borne across the waters? Of course it is not hard to find the exact reason why this should be; but we must not seek for it in patriotism. Is the head of a department as a rule a patriot? Does he love his country and labour only for her good? Would he rather forfeit private benefits than help forward by quick acceptance of a good thing that state-paid machinery, the Navy? Let us hope that the British Official, head or no head, is a patriot. Yet it is strange that the Royal Navy should languish in the hands of patriots, that no attempt should be made to provide for men to man the fleet, that no briskness should ever be discovered in the nature of private contracts and in Government yards till the foe has begun to arm and the Press to yell. The manning of the fleet is a difficulty that will trouble a good many people some of these days.

[1] There can be no doubt whatever that that machine, the battleship or cruiser, must soon come under the entire control of the only people who understand her—I mean the Royal Naval Engineers.

In what direction do the eyes of the heads and the authorities turn when they talk of manning the fleet? The merchant sailor complains that the foreigner is accepted over him: it is true. Sixty or seventy per cent. of foreigners now fill those ships which certain protective clauses in the old Navigation Laws would have made nurseries of—nurseries of British seamen. Not a craft but should have been dealt with as a nursery. The very smacksmen, harmless trawlers on the Doggerbank, these and their giant apprentices should under the apprenticeship clause have helped swell the lists of men available for the manning of the merchantman in the hour of need.

And, touching the smack as a type, one must say, even of this quaint and picturesque detail of the coast, that she has shared the fate of ships and suffered improvement. Certainly there are no finer craft of their kind afloat than many of the smacks of the eastern coasts and the vessels which hail from Ramsgate. I sometimes wonder what sort of a fabric was that old cod-smack whose bowsprit smashed through the window of the cabin in which Mr. Henry Fielding, the author of 'Tom Jones,' was seated, a helpless cripple, waiting for the brute of a captain to lift his anchor and carry him and his wife away to Lisbon. She probably lives somewhere in Hogarth. That she was all buttock, bow, and well, we need not fear to believe. No doubt the old cod-smack floated propertied with all those quaintnesses which characterised the shipping of her time. But she must yield and sink out of sight into the ooze of years when the modern smack comes smoking along.

I will take a dandy-rigged smack of sixty tons: she shall be called the 'Cambria,' and she shall hail from Ramsgate. I have looked at such a vessel often, and never without admiring more and more the skill and judgment which have gone to the building of her. Her high bow dominates the seas; swiftness

is not needful, she does not want to tear her nets to pieces; her mainmast is so stepped as to seem to incline forward, but it is the sheer that deceives the eye. Years of practical experience are in her. She has been built to fight the North Sea, and she has come off victorious, often sailing out of a hurricane with her hold full of great white fish, whilst big ships founder in the haze of the horizon as she flies past, soaring in foam with the buoyancy of the bird that follows her.

## VI.

A GOOD many years ago Mr. Chatfield, of her Majesty's Dockyard, Plymouth, read at a meeting of the British Association a paper on shipbuilding, in the course of which he communicated these interesting facts to his audience. He said that an 80-gun ship—such a vessel, for example, as the 'Hindostan,' which was then nearly ready for being launched—demanded in materials about 4,200 loads of timber, the produce of 90 acres of ground, occupying 80 years in its growth, which would be equal to 5,600 acres for one year. The value of the labour was about 12,000*l.* The cost of the ship was 72,000*l.* Mr. Chatfield stated that the average durability of ships of war 'employed on active service has been calculated to be about thirteen years when built of British oak, which happens,' he added, 'to be precisely the period the "Hindostan" has been building, for she was commenced in August 1828, and will be launched in August 1841.'

The 'Hindoston' ate up many acres; yet she was just that type of vessel for whose retention in the service of her country my lords and post-captains and aged lieutenants, and a vast number of people whose power of intellectual vision might be gauged by the length of their noses, were blustering and chattering, with the acrimony of stupid men and the noise of a forestful of monkeys.

The long and short of it was: Much about the time when the question of building ships in iron was being hotly debated by all whom it interested, *then*, if the spade had not been driven

into the earth in an enthusiastic upheaval of the ore with which many districts of this country teem, our shipping would have faded; we should have degenerated as a maritime power into another Norway or Sweden. The country was full of iron, but was growing rapidly short of timber. It was a national question, then, that our ships should be built in our own ports, with materials of our own production, procured by the labour of our own population. This was the contention of the excellent and heroic John Grantham, who was amongst the first to plead—by the pen, by declamation, and by the example of building—for the substitution of timber by iron in the construction of the ship.

It is scarcely credible that the employment of iron in shipbuilding should for years have continued to meet with bigoted opposition—that is, in the face of the success, or the promises of enormous future success, which had been achieved out of this metal. For instance, the first *iron steamer* that ever put to sea was called the 'Aaron Manby,' and was built, in or about 1821, from parts which had been manufactured in Paris and sent to London to be put together. It is honourable to the memory of Sir Charles Napier, creditable to his sagacity and foresight, that he should have foreseen in some sort the issues of a conjunction of metal with steam. He it was who formed a society or company jointly with the engineer Charles Manby for the building of this iron steamboat. When she was built (in London) she received a cargo of linseed and iron castings, and Captain Napier safely navigated her from London to Havre, thence to Paris. From 1822 to 1830 the hull of the 'Aaron Manby' never required to be repaired, though she had been often aground when full up with cargo. The country, with the Admiralty in the foreground, looked on and made no sign. The 'Aaron Manby' was certainly no beauty. She was

not like the typical frigate, for example; but she was a hint of deepest significance. And, consistently with the traditions of the Red Tape departments, the Heads, in the manner of Sir Joshua, shifted their ear-trumpets and *only* took snuff.

FULTON'S FIRST STEAMER, THE 'CLERMONT'

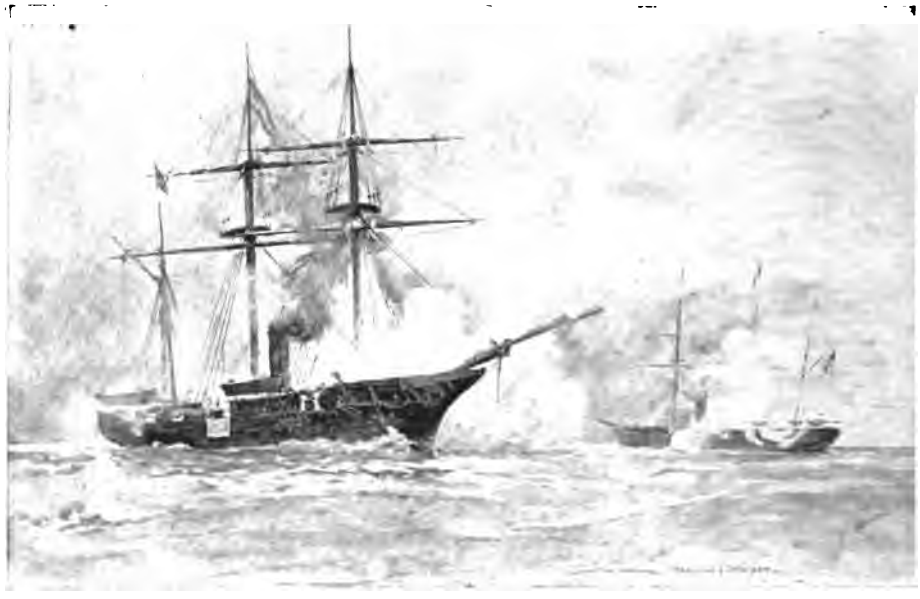
Scott Russell, the well-known engineer, in a short treatise gave an example of the character of the objections urged against iron. 'A good many years ago,' he says, 'I happened to converse with the chief naval architect of one of our dock-yards on the subject of building ships of iron. The answer

was characteristic, and the feeling it expressed so strong and natural that I have never forgotten it. He said, with some indignation, "Don't talk to me about iron ships: *it's contrary to nature.*"'

Although we hear of iron boats in the last century, whilst so long ago as 1809 Richard Trevethick and another proposed the building of 'large ships with decks, beams, and sides of plate iron,' also with 'masts, yards, and spars to be constructed of iron in plates, with telescope joints or screwed together,' yet it does not appear that the first iron vessel deserving the name made her appearance before 1818, in which year she was built on the banks of the Monkton Canal. It might be, however, that there is as much uncertainty as to the date of the launching of the first iron vessel as there is as to the claims of the invention of the screw-propeller, or, which is more serious, of the marine engine. One is surprised, on looking into sea literature, to find how much was anticipated in theory, but delayed in practice by ignorance and obstinacy. What sailor, who has not studied this subject, but must be astonished to hear that some ninety odd years ago Trevethick was proposing, or had manufactured, that sort of masts 'with telescope joints' with which certain of our sailing ships are equipped in our times? No doubt the real inventor is the man who applies the idea. Not much good can result in an old Lord Worcester, for example, sitting musing over the possibilities of steam as expressed by a spouting tea-kettle and the tremors of the kettle's lid; we are more obliged to James Watt for his embodiment—to Watt who explained, in 1769, how the steam-engine was to be made and employed effectively for marine propulsion.

The history of the steamer carries the reader farther back into history than those who have not given their attention to

the subject would think possible. 'Wonderful thing, steam, sir,' is still as frequent a thought in the mind in these days as it was a stereotyped exclamation in times when Charles Dickens was young, and in the age of the first of the dog's-eared Thames steamers. Even so long ago as 1630 David Ramsay obtained a patent for an invention 'to make boats, ships, and barges to go against wind and tide,' and 'to raise water from low pits by fire.' The procession of steamboat inventors,



THE CONFEDERATE CRUISER 'ALABAMA'

indeed, is rather long: they march in upon us of this century out of the dark ages; but unfortunately they bring nothing but their ideas with them. Every man flourishes his specification; but one can't steam to New York in six days on a dream.

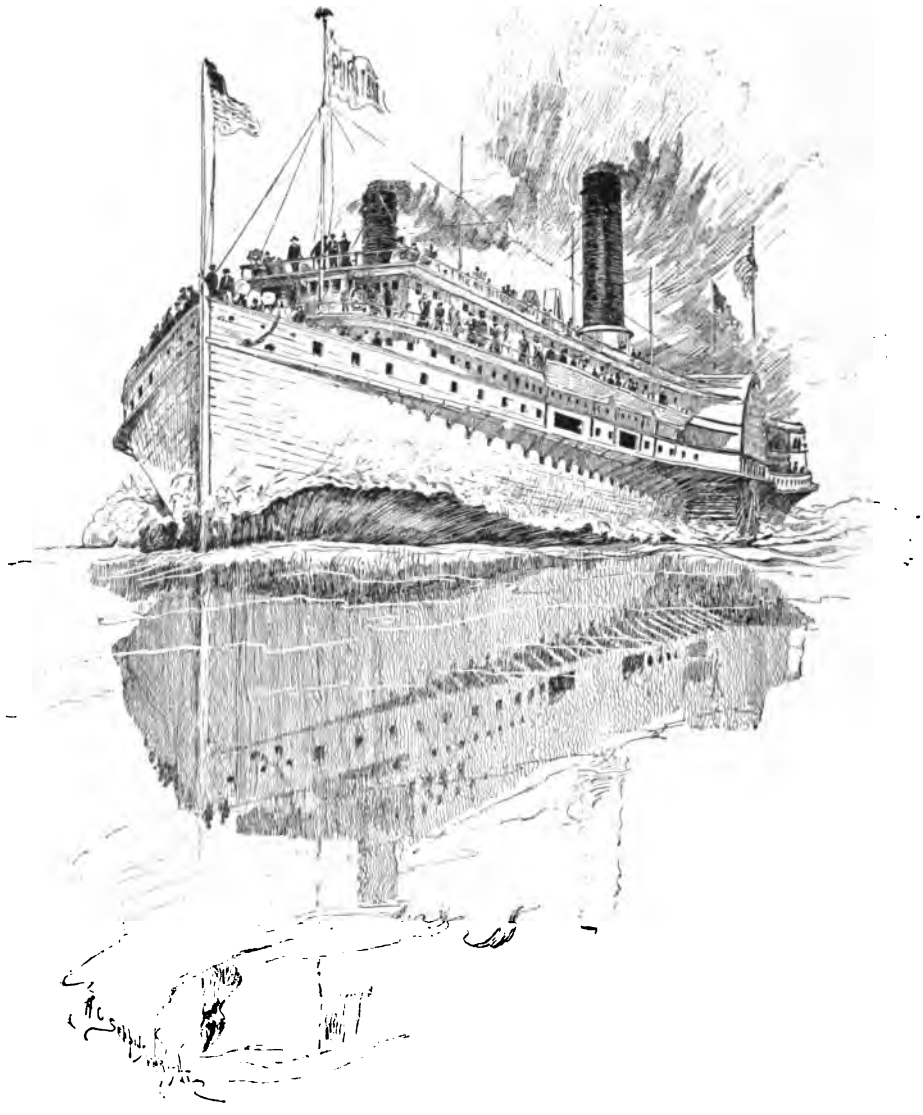
Let us then start with a gentleman who devised something that begins to look like a boat with stern wheels, and a funnel in the forecastle. His name was Jonathan Hull, and the date of his ship is about 1736. To-day a well-known firm of

Thames builders (Messrs. Yarrow) are frequently constructing stern-wheel steamers for rivers and shallow waters. I do not say that their vessels are not more beautiful than old Jonathan Hull's little, lumpish steam ark, but Hull's was first, and so we salute his memory.

Hull's scheme for obtaining a rotary motion was wonderfully clever; but nothing short of his specification could explain it, and the reader might not thank me for reproducing a document (out of 'Woodcroft's Specifications of Marine Propulsion') which is all about how to drive a paddle-wheel by converting a reciprocating rectilinear motion into a continuous rotary one.

The invention of the marine steam-engine has a vast number of claimants. One looks around the crowd bewildered. If I may, with the utmost modesty, venture an opinion, I should say that the first man to give practical and useful form to the idea of driving a wooden hull by steam machinery was Symington, who, in 1801, fitted up a steamboat, at the instance of Lord Dundas, for the Forth and Clyde Canal Company. She towed two vessels of an aggregate burden of a hundred and forty tons, at the rate of three miles and a quarter per hour, in the teeth of a strong breeze. Justice should be done to John Fitch, however, an American, who so early as 1784 had obtained rights to run steamboats on the waters of Virginia and Maryland. His partner was one Rumsey. Afterwards the States of Pennsylvania and New York granted Fitch exclusive rights in the use of their waters. His boat was nine tons, and his engine drove her five miles an hour. He failed for want of money, and died by his own hands in 1798. One who knew him says he could think of nothing but his steamboat, and he fell into rags and broken boots through wandering about talking of her. The same authority says that he met him at the house of a boat-builder, a man named Wilson, with whom was

associated his blacksmith, Peter Brown, where, 'after indulging himself for some time in this never-failing topic of deep excite-



THE FALL RIVER BOAT 'PURITAN'

ment, he concluded with these memorable words: "Well gentlemen, though I shall not live to see the time, you will, when steamboats will be preferred to all other means of conveyance, and especially for passengers; and they will be particularly useful in the navigation of the river Mississippi." He then retired; on which Brown, turning to Wilson, exclaimed in a tone of deep sympathy, "Poor fellow! what a pity he is crazy!"

Robert Fulton, by the Americans, appears to be advanced as the person who first conceived the idea of propelling vessels by steam. Whether he borrowed his notion from Symington or not matters little to us who get the good of it. It is not an international question, and others in an experimental way were before them both. Fulton's first boat was the 'Clermont,' and those who describe her say that her engine was uncommonly like that of the machinery of the 'Charlotte Dundas,' the boat which Symington had engined. As a craft driven by steam she made a considerable figure for those times, being 130 feet long and 16½ feet broad, and of a carrying capacity of 160 ton; her engine was 18 horse-power. All things considered, she looks a shapely boat in her picture. Her paddle-wheels are indeed far forward, and her rig, a single pole formast, one yard across, and mizzen-mast, is not very pleasing, but her hull is quite sightly; her run from the sponsons suggests the clipper lines of the future ship.

A steamer called the 'Comet' was plying between Glasgow and Greenock in 1813. She was the fruit of the genius of Henry Bell. All the best engineers appear to have been Scotchmen. This admirable thinker went to the British Government with his ideas. It will be supposed that the Board of Admiralty gave this genius a very careful hearing, closely examined his specifications, promised him handsome pecuniary

aid in the development of his noble ideas, and affirmed their intention to be present at any test experiments in this wonderful new power and application of steam which Mr. Bell might be

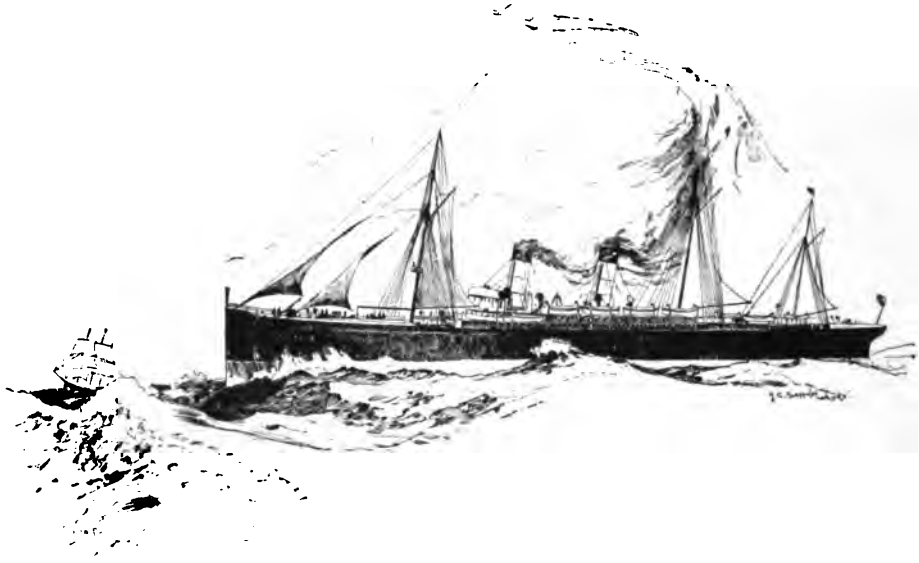
DONALD CURRIE LINER 'DUNOTTAR CASTLE'

good enough to make. In reality the Board of Admiralty declined to give Bell a hearing. He went to foreign European

Governments with his scheme, but met with no response. He went to the Government of the United States, but Fulton was before him. Fulton and he, nevertheless, got into correspondence. Fulton appears to have written to Bell at the instance of the United States Government. He got what he could from Bell, and thanked him by saying 'he had constructed a steamer from the different drawings of the machinery forwarded to him by Bell, which was likely to succeed with some necessary improvements.' This man Fulton appears to have been a cold, unfeeling person, who, borrowing his ideas from poor or impoverished inventors, 'improved' upon them, for no other purpose than to appropriate them. Bell, heart-sickened, went to work, with the help of John Wood & Company, of Port Glasgow, to build a steamer of 40 feet keel and 10 feet 6 inches beam, with an engine and paddles. This little steamer was certainly wanting in the comeliness of Fulton's. It is impossible to think of her, nevertheless, without reverence. As you gaze the new era seems to dawn. In the gloom and chill of that great change you see the figures of those early inventors, men much laughed at, much neglected, but of spirit too fiery and obstinate to be subdued by the grin of the fool or the neglect of the official bigwig. Out of that little 'Comet' grows the magnificent steamship of to-day. Who can calculate the usefulness such a man as Bell has proved to the world? We see kings and queens set up on high in stone, we behold effigies to snobs and nobs, memorials to people who were a curse to their species in their lives. I confess I am revolutionist enough at heart to wish to see many of these travesties, degrading to the dignity of man, levelled, and their pompous and ridiculous inscriptions defaced, and the images of such true friends of humanity as Bell set up on high in their room.

Private enterprise helped forward an invention which our

Government would not even glance askant at. A steamboat was built at Leeds in 1813, and two in the same year at Manchester and Bristol respectively. The largest steamer, according to the author of the 'Life of James Watt,' that had been built up to the year 1813 was the 'Glasgow,' of 74 tons and 16 horse-power. Two years later the 'Morning Star,' of 100 tons and 26 horse-power, and the 'Caledonia,' of 102 tons and 32 horse-power, were launched. The stem of the steam-



WHITE STAR LINER 'MAJESTIC'

boat had at last swept through the barricade of prejudice, and the ocean lay under her bows.

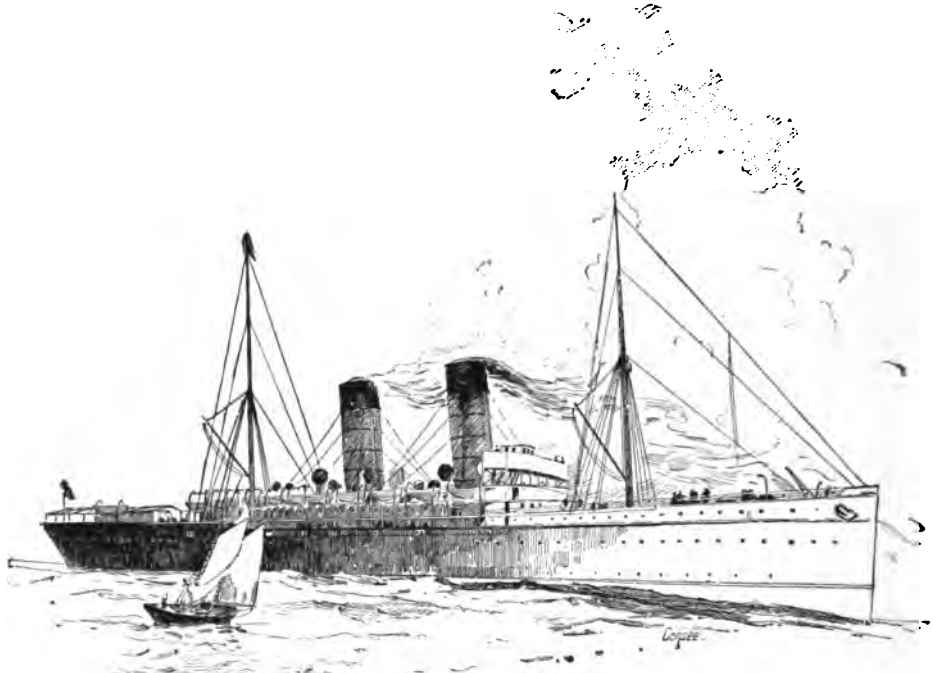
It would fatigue the reader to give one by one the names of the ships which followed close in the wake of the 'Comet' and Symington's craft. We scarcely come to anything considerable in steam until David Napier steps upon the scene. There is no name more honourably associated with the development of the marine steam-engine than David Napier's. He was one of the earliest to give practical and expansive appli-

cation to what may justly be called the 'discovery.' He engined the 'Rob Roy' in 1818, from the yard of that celebrated firm of shipbuilders, William Denny & Bros. (there were no brothers, however, I believe, till 1847: I mention these firms as they are now known). The 'Rob Roy'— a small vessel, an experimental, but a quite successful craft— was followed by several larger wooden steamers, and these boats established a regular line of steam between Liverpool and Glasgow.

By degrees the steamship increased in breadth and length. Steele of Greenock in 1826 built the 'United Kingdom'; Napier engined her; and this miracle of her age was 160 feet long and 26½ feet beam, and she was driven by engines of 200 horse-power. Crowds assembled to view her; greater crowds would assemble to view her if she were still afloat. It has, however, been justly remarked that the progress of steam would have been slow—possibly, indeed, a halt might have been cried had it not been for the substitution of iron for wood. We have only to conceive such a fabric, say, as that of the old 'Royal George' engined with a power that drives such a ship as the latest of the Cunarders over the Atlantic: she would go to pieces like a house of cards; her engines would sink out of her; and in a mighty explosion the last of the old bucket would be seen high aloft coming down in a thunderstorm of blackened beams and burning plank.

It is not a little extraordinary that, whilst the marine steam-engine was occupying the attention of such inventors as I have named, there should have been men as heroic as the steam pioneers, who were insisting upon the utilisation of iron as a material for the construction of ships, if the shipping of this country was to be saved to her in any sort of abundance. The two conditions of steam and iron arose side by side, as though

there was a special providence in this marvellous conjunction. As we have seen, the first *iron* steamer was the 'Aaron Manby'; the next was the 'Marquis Wellesley,' built by the Horsley Company. She was constructed on the principle of what was then called the twin-boat—that is, she had her paddle-wheel in



CUNARD LINER 'CAMPANIA'

the centre. She crossed the Channel in 1825, and in 1868 her hull was reported to be sound and the best part of her. Amongst the earlier iron steamers of note were the 'Alburkah,' a vessel 70 feet long by 13 feet beam, with an engine of 16 horse-power, built by MacGregor Laird in 1831, and engined by Fawcett & Co. (she drew 3 feet 6 inches, and her passage to the River Niger was rendered notable by her disproving the old-fashioned idea that a light draught of

water was dangerous); the 'John Randolph,' 250 tons, built for Savannah in 1833, and the 'Garry Owen,' for the Lower Shannon, in 1834, both by John Laird, who, it was stated, had by this year already constructed 225 vessels, of an aggregate burthen of 88,000 tons and 16,200 horse-power.

This is sixty years ago; and now a single steamship will nearly receive the horse-power that was distributed amongst 225 vessels. The progress is marvellous; but the wreaths lie thickest where the race began. The 'Rainbow,' of 580 tons, the 'Nemesis,' and 'Phlegethon' were next sent afloat. These last two ships were built by Laird for the East India Company, and they should always be memorable in the annals of iron ship-building as being the first iron steamers ever engaged in warfare. They took part in the China War of 1842. Captain (afterwards Admiral) Sir W. H. Hall was in command of the 'Nemesis,' and in his evidence before a Committee on Navy Estimates, which sat in 1848, he stated that his ship was struck fourteen times by the enemy's shot. 'One shot went in at one side and came out at the other; it went right through the vessel. There were no splinters: it went through just as if you had put your finger through a piece of paper.' Several wooden steamers, he told the Committee, were employed upon the same service, and they all had to lie up for repairs; whilst the commander of the 'Nemesis' could repair his vessel in twenty-four hours, and have her always ready for service. 'Repairs which would have taken in a wooden ship seven days would have taken in ours as many hours.'

Commander Robinson, in 'The British Fleet,' apologises for Admiralty inertness at this period, but one presumes that he does not wish to be taken seriously. He says that 'attention began to be turned to the capabilities of steam in naval

warfare shortly after 1815.' Yet he points out that nothing was done for seven years, when a couple of small wooden paddle-steamers were built, with a view of towing ships of war in and out of harbour. To Brunel's urgent representations that steam was the incoming power, and that everything must presently yield to it, their lordships, in their traditionary waggish way, replied as follows: 'They deemed it unnecessary to enter into the question as to how far the power of the steam-engine might be made applicable to the general purposes of navigation.' In this fashion are the interests of a nation promoted by square men in round holes, who deem things unnecessary.

Lindsay took some trouble to collect the reasons for the Admiralty's rejection of steam, and for their lordships' deplorable tardiness in the adoption of iron instead of timber as a material for shipbuilding. He points out that the Admiralty contended —first, that a shot would penetrate an iron ship more easily than a wooden one, whilst the holes could not be plugged; second, wood, when pierced, rapidly contracted, and almost healed itself. As usual, experience was bought at a heavy cost to the nation. The Admiralty had to discover that a paddle-box is a target to an enemy, and that the screw-propeller submerged does its work secretly and hiddenly; the Admiralty were also forced to learn that iron was better than wood for purposes of warfare. 'Yet,' says Lindsay, 'these resolutions were only carried into practice after vast sums of money had been expended on the reconstruction of a *wooden* British Navy, for which in one year alone, and that so lately as 1861, when almost everybody except themselves saw that iron must supersede timber, they demanded from Parliament (and carried their vote) no less than 949,371*l.* to replenish the stock of wood in the dockyards—a sum far in excess of any

previous vote for that material.' The moral of this slowness of official comprehension is—what? If we look around, shall we be able to apply it to to-day? The speaking-trumpet of the old cocked-hatted seafarer sounds from afar, and warns us, in a note of alarm, not to hang back as *he* did, but to go ahead. I say that that speaking-trumpet *ought* to sound; but, unhappily, it is too often buried with its owner, and is choked, and we heed not what we hear not.

It has been said that the screw propeller was known to the Chinese; it is possible that the advocates of the claimants to this invention may have agreed to attribute it to the Chinese for the sake of peace. There are many claimants. The French genius of the screw stands upright in stone at Boulogne; but another Frenchman, it seems, was before M. Sauvage. In this country in the last century we had Wasborough and Bramah and Shorter with ideas about the screw propeller, and these men were certainly ahead of Frédéric Sauvage of Boulogne, seeing that he did nothing till 1832. I think we must all claim the invention, or application of the propeller, as we now know it, for Thomas Pettit Smith—though that very clever Swede, Ericsson, deserves all honourable mention for his handsome efforts to introduce the propeller into the United States. His first patron was Captain Stockton, for whom he built two propeller-boats for American waters. But the story of the screw must be reserved for another article.

## VII.

I CANNOT gather that the importation of the screw propeller at the start materially altered the shape of ships. Specifications of early paddle-wheel steamers and of early screw steamers lie before me; and proportionately to their tonnage I observe little or no difference between them in their length and breadth. In 1833 Mr. Robert Wilson submitted a screw of his own invention to the Admiralty. The Woolwich Dockyard officials rejected it because they thought that it involved a greater loss of power than the common mode of applying the wheels to the side. So Wilson's screw went the way of many other good things. Then followed Captain John Ericsson: his experiments were watched by the Lords of the Admiralty, who were accompained by Sir William Symonds, the designer of some of the most beautiful models which ever floated upon the seas. Sir William does not seem to have appreciated the screw; he suspected that a ship would not steer if driven by a propeller, and this was his judgment in spite of the practical tests which he witnessed in company with 'my lords,' Sir Edward Parry and Captain Beaufort.

Meanwhile—that is, on May 31, 1836—Mr. Thomas Pettit Smith had patented a propeller of his own invention. He fitted it to a vessel called the 'Archimedes,' of something under two hundred and fifty tons, and a draught of a trifle over nine feet. Three years passed away, during which the 'Archimedes' does not appear to have greatly raised the

screw-propeller in the esteem of mankind. She raced with the 'Widgeon,' a fast paddle steamer for her age; both were under canvas, and the 'Archimedes' beat. The 'Archimedes' decisively illustrated the advantage of the screw over the paddle-wheel. There was no huge paddle-box to be torn away by a mountain-high sea, leaving the red wheel whirling naked in foam; the thrust was secret, and just that very power of propulsion which you would say the British Admiralty should have immediately applied to their warships. What followed? The 'Archimedes' lay unemployed in dock. Her proprietors offered her for sale, and the man to whom their lordships and the world were indebted for the introduction of the screw-propeller lost all the capital he had embarked.

Eventually—that is, in 1843—a screw steamer named the 'Rattler' was ordered by the Admiralty. Her lines were very fine for those days: she was 195 feet extreme length and 33 feet extreme breadth, and her carrying capacity was 888 tons. (Commander Robinson writes of her as a hundred tons less than this.) Her trials were not convincing. In 1845 she was in company with the 'Victoria and Albert' and the 'Black Eagle,' and in a strong head wind they went ahead of her. This appears to have produced an unfavourable impression, and the 'Rattler' certainly retarded the progress of the screw in its application to ships of war.

Steam, however, whether by the agency of the screw or the paddle-wheel, was to revolutionise the state and form of the ship. In the merchant service this was peculiarly so. The steamer was wanted for purposes of trade and profit. She was to be shaped by the influence of the cost of freight per ton. It is to iron, however, that we must turn for our illustrations of marine architecture. The British Government applied the propeller to their wooden ships of war despite the disastrous

experience of others. For example, shortly after the introduction of the screw, attempts were made by the Americans to apply it to large timber-built vessels for the merchant service, and four or five ships arrived one after another at Liverpool. They were fine vessels, but not one of them made a second voyage, in consequence of their commercial failure. This I state on the authority of Grantham. The screw seems unfitted

A MISSISSIPPI STEAMBOAT

to timber. One might suppose that great masses of iron wheel whirring and thrashing on either side of a wooden fabric would prove more swiftly destructive than the screw. Yet the early American lake and river steamers disproved this: they were built of wood, they were thrashed through it at mighty speeds, and the structures hung together till they blew up. Our artist submits a charming picture of an American wood-built river boat. In the construction of these boats the American builder

THE 'GREAT EASTERN'

has given us a convincing example of his genius and judgment. When the Americans first began to build their river steamers, they were immeasurably ahead of ours in model and speed. Most of their boats were, as they still are, wonderful illustrations of fitness to requirements. To Robert L. Stevens the American river boat owed her qualities of charm of shape and swiftness of keel. He built on the finest models; nothing sharper in entrance, nothing cleaner in runs, had before been attempted. He cut old craft in halves and lengthened them thirty feet, adding a false bow that gave them another twenty feet forward in true lines with the planking, and they skimmed the water at twenty miles an hour.

As the need for such vessels increased, and the builders' experience enlarged, these river steamers grew more and more swift and splendid. The power of beautiful racing machinery was in them, and drove them in meteoric flight; and, as has been pointed out, the tenacity and strength of American iron enabled the constructor to give his engines proportions much lighter than would be thought safe in this or other countries.

Speaking of crossing the Atlantic Ocean by steam, Dr. Dionysius Lardner, who was a very able man, despite that last infimity of noble minds, the practice of predicting before and not after the event, stated in 1835 that, 'as to the project which was announced in the newspapers, of making the voyage directly from New York to Liverpool, it was, he had no hesitation in saying, perfectly chimerical, and they might as well talk of making a voyage from New York or Liverpool to the moon.' This alarming prophecy, however, does not appear to have damped the spirits of hopeful inventors and enterprising shipowners. I do not speak with conviction, yet I have an idea that the first screw steamer that crossed the Atlantic was the 'Robert F. Stockton,' built of iron by Laird. Her tonnage,

which I cannot find, may be gathered from her dimensions, which were: length 70 feet, beam 10 feet, depth 6 feet 9 inches. Her average speed in smooth water was about 7½ knots. She carried a crew of four men and a boy; her master was Captain Cram. She was about forty-two days in accomplishing the voyage to New York; and Cram, on his arrival, was justly presented with the freedom of that city.

Shipbuilding, indeed, now that iron and steam and the paddle and the screw had combined their Titan forces, was, despite departmental sloth and philosophic prophecy, about to make gigantic departures, and to venture upon forms and methods which would have as greatly astonished the early advocates of metal in construction, as the ancient shipwright would have been astounded by the recommendation of metal plates instead of planks. Not that iron was to be instantly surpreme: the 'Great Western,' a steamship that was the marvel of her age, and the first that was specially constructed for the trade between this country and America, was built of wood by Patterson of Bristol. This ship was 212 feet long, with 35 feet 4 inches beam, and an inch or two over 23 feet depth of hold. She was a noble ship in her day, and greatly admired. She made her first voyage to New York in fifteen days, her average speed being 208 miles, or 8·2 per hour. Her registered burden was 1,340 tons.

This was a big ship for 1838; but a bigger was to follow—not until some years had elapsed, however, nor before everything flying the red flag (with few exceptions) driven by steam was being constructed of iron. On May 1, 1854, Brunel and Scott-Russell began the building of the 'Great Eastern' at Millwall, on the north side of the Thames. This immense ship will always be talked about: she is a part of history, and, unlike the majority of ships which are dead and gone, she belongs to

time. I was a mile away from her once when she passed through the Gulls, and she looked as if she were a manufacturing city gone adrift. I was rather too young to admire her hull; I could only marvel at the number of her chimneys and her masts. Since then I have ascertained that she was a very perfect model, a ship within a ship, of a clean entry and a beautiful, fair, and steady run in the exterior shell. Giantesses urged by machinery infinitely more superb in invention and finish than anything that was shipped aboard the 'Leviathan' (as she was first called) are crushing the Atlantic surge daily; but there is nothing at this hour afloat, and probably the world will never again see, so vast a sea-borne fabric as the 'Great Eastern.'[1] Her length between perpendiculars was 680 feet, and on the upper deck 692 feet; the breadth of the hull was 83 feet, and from paddle-box to paddle-box 118 feet. A contemporary enthusiast tells us that 118 feet 'is the width of Portland Place, one of the broadest streets in London.' The depth of this great ship's hull was 60 feet; the weight of the iron contained in her hull 8,000 tons; and the weight of the whole ship, when fully laden, 25,000 tons. Thus loaded, she drew 30 feet of water. Further statistics of her construction are curious. We recall the number of acres of oak which an old man-of-war ate up. Here was a ship held together by no less than 3,000,000 rivets. The plates which formed her were 30,000 in number, and each plate weighed about a third of a ton.

We need not pursue her story. She was an unfortunate ship from the hour of her launch. Is there any moral in the memory of her that is to express limitation in dimensions? The cellular system of water ballast seems to have been indicated in the construction of this ship—though I cannot say that the idea originated with the designers. She could fill up with water ballast,

[1] Written before the launch of the White Star Liner 'Oceanic.'

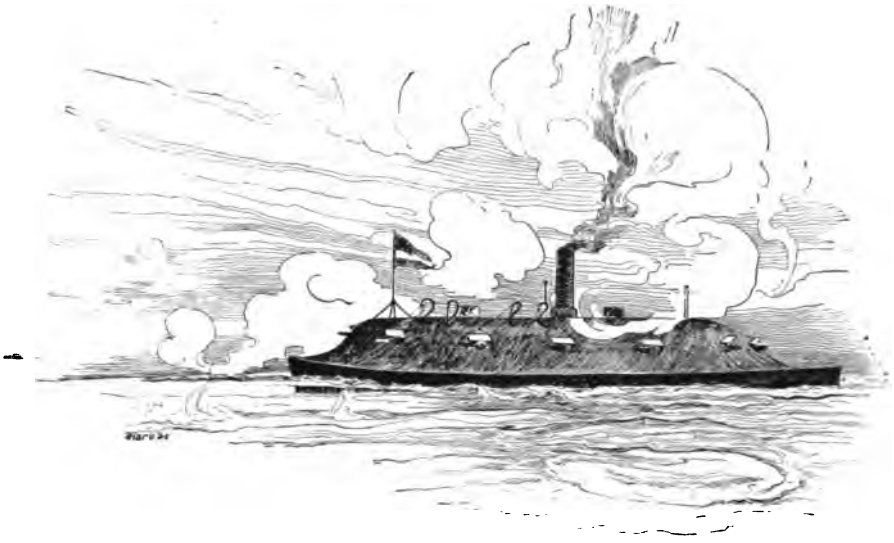
when necessary, to the weight of 2,500 tons. The 'Great Eastern' was a huge hotel; her tradition should be respected by a generation who live in big hotels. She could have accommodated 4,000 passengers, irrespective of a crew amounting to about 400. The captain telegraphed his orders to the engine-room by electricity, and signalled his commands during the day by semaphore arms and at night by coloured lamps. The life of a master of such a ship must have been an uneasy one. When it comes to the navigation of so much bulk, not one, but half a dozen captains should sign her articles, and every gentleman in buttons and lace should have a piece of the ship to himself—all hands, of course, working in harmony.

It does not seem that iron suggested itself to anybody as a material which might be useful in the protection of the sides of battleships until the period of the great war between the Northern and Southern States of America. When the Gosport (U. S.) Navy-yard was burnt in 1861, among the ships destroyed was the frigate 'Merrimac.' She was scuttled as well as fired, and sank before she was much damaged. The Confederates raised and repaired her, and covered her with a sloping roof, plating her with railway iron, and heavily sheathing her bow with metal. They rechristened her the 'Virginia': but the name of 'Merrimac' stuck.

Reports of this ship reached the North, and alarmed the Government. She undoubtedly quickened their movements in the construction of armoured warships. One built by Ericsson is represented by the artist. She was a novelty in naval architecture in those days; but we have lived to see ships infinitely more ugly and out-and-away more perilous to those who trusted their lives in them. She was 160 feet long, with a beam of 42 feet. Her deck, which was almost flush with the water's edge, was crowned amidships by a revolving turret

carrying two eleven-inch Dahlgren guns. An interesting and a full statement of the loss of the 'Monitor' will be found in a communication from Rear-Admiral Lee, of the United States Navy, in a report of the Secretary of the Navy in relation to armoured vessels (Washington, 1864).

The 'Merrimac' fought the 'Monitor' once, and fought no more. Her shot flew over the Federal craft, which finding her enemy aground, steered round and round her. When



THE CONFEDERATE IRONCLAD 'MERRIMAC'

the armoured frigate floated, she steered to her anchorage at Craney Island. It was the first battle between protected ships, and interesting for that reason. The idea, then, of protecting ships' sides with metal seems to have originated with those who raised and equipped the 'Merrimac'; Ericsson followed. The 'Monitor's' revolving turret was the invention of Theodore R. Timby, of Duchess County, New York, who had filed a caveat and exhibited an iron model as early as 1843.

One of the largest ships built prior to the launch of the

'Great Eastern' was the 'Great Britain.' She was completed in 1843, but did not make her experimental trip till the following year. I count six masts in the picture before me, and a single funnel; she has chequered sides. She was one of the best-built boats ever sent afloat for, stranding on the coast of Ireland shortly after she had been placed on the American station, she lay a whole winter beaten by heavy seas without

THE 'MONITOR' IN HAMPTON ROADS

suffering any material injury. Everybody talked of this ship when she was fresh; the Queen and Prince Albert visited her on her arrival in the Thames. But the significance the commercial world found in her lay in this: she was to be employed as one of the trans-Atlantic steamers built to drive the celebrated American sailing clippers off to sea.

I particularly note that all that benefited the ship, all that makes her nearly as we know her, came from our commercial

rivalry with the Americans. When they found their clippers useless, they built a beautiful ship of 751 tons, and engined her with an auxiliary screw—that is, a screw that can be raised out of the water when the sails only are needed. She cost 16,000*l.* But she would not do. The Cunard Company was in existence, and had started the mail service with steam in 1840. The 'Cambria' and the 'Hibernia' of this company were ships of 300 horse-power and 1,422 tons, and their average speed was 9¼ knots. Their 'America,' 'Niagara,' 'Europe,' and 'Canada' rose to 1820 tons; and they were driven by 680-horse-power engines, their speed being 10½ knots. To oppose these ships, which threatened destruction to their maritime commerce, the Americans—for practically all America was interested—started in 1847, a line of steamers which ran between New York and Bremen, calling at Southampton. The Cunard liner 'Britannia' raced the first of them (the 'Washington'), and beat her by two full days, spite of the *New York Herald's* advice to the English vessel's skipper 'to run by the deep mines, and put in more coal.' It is impossible to view the picture of the 'Washington' without wondering at her ugliness. One would expect a comlier shape at the hands of an American builder. It is remarkable that the unwieldy bulk, with its hamper of square rig, should have been slapped across the Atlantic in a passage two days longer only than that occupied by the 'Britannia.' The 'Washington' was like an old wooden frigate. She was about 2,000 tons burthen. The 'Britannia,' on the other hand, was but 1,156 tons; her nominal horse-power was 423; she was 207 feet long, and 34 feet 4 inches in extreme breadth; and was therefore a smaller ship than the 'Washington' and of less power, the American's power being to her tonnage as 1 to 2, while the 'Britannia' had only 1 horse-power to 2¾ tons. The British ship will always be memorable as the vessel in which

Charles Dickens made his first voyage to America. The very best sea description in the language is the great novelists account of the behaviour of the 'Britannia' in a gale.

Competition continued keen between America and this country. The Government of the United States guaranteed a considerable sum per voyage to the steam vessels of the

THE YACHT 'AMERICA'

company that was being promoted by the well-known E. K. Collins of New York. All this signified fresh struggles and new departures in the science of shipbuilding. The Collins steamers were about 3,000 tons register and 800 horse-power; they were built chiefly of live oak, and the fabrics were strengthened by a lattice-work of iron bands. They are said to have been beautiful models. One of them, the 'Arctic,' was known as the 'Clipper of the Seas.' This steamer was built by

W. H. Brown of New York under the superintendence of George Steers, who modelled the famous yacht 'America' of which our artist has provided us with a spirited sketch.

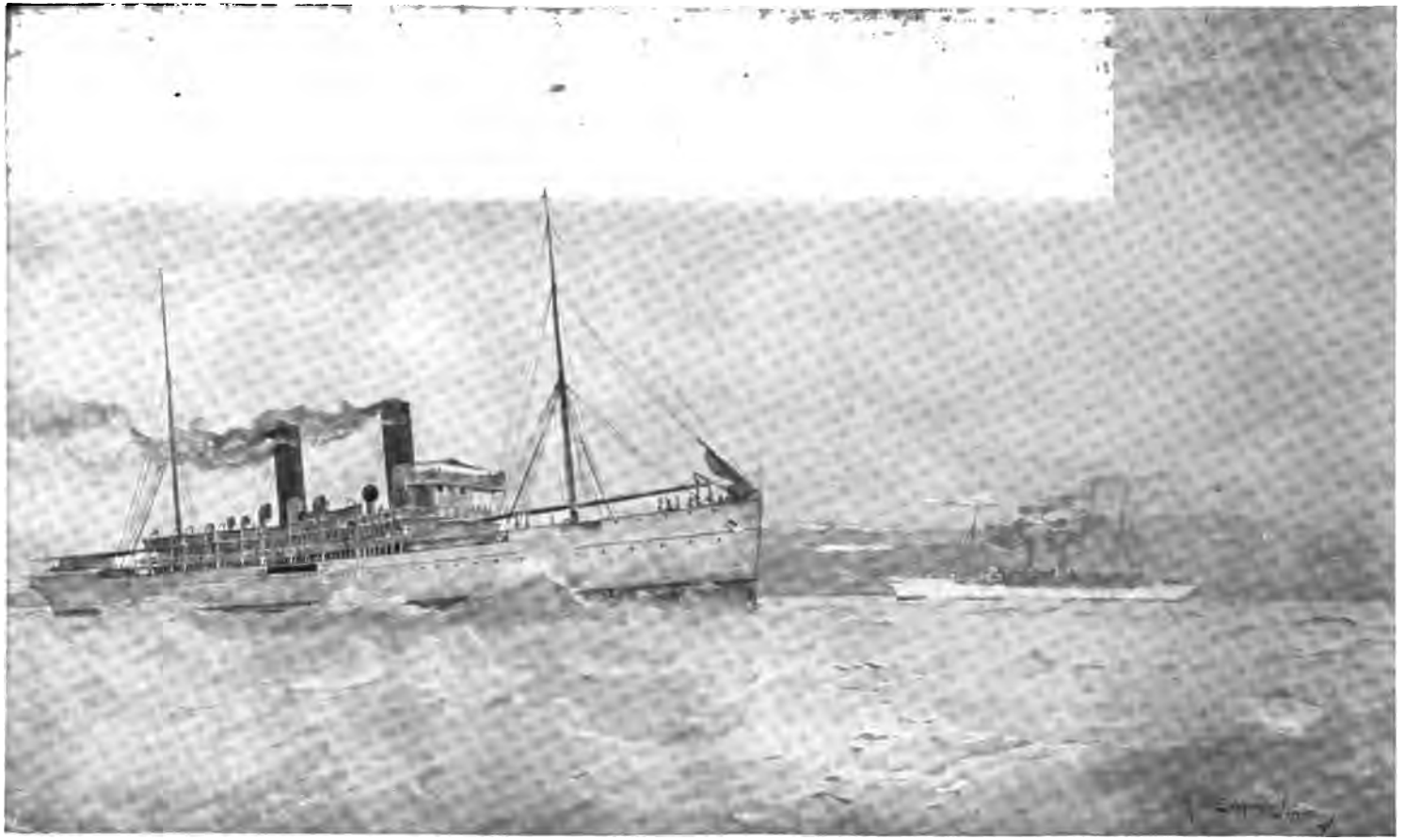
I might mention the Collins liner 'Pacific' as an illustration of the influence of competition in the direction of shapes and interior equipment. Here was a ship with three decks, sitting as high on the water as an old galleon; her bottom was flat, and her immersed section almost a parallelogram. This ship, in May 1851, steamed across the Atlantic from New York to Liverpool in 9 days 20 hours 16 minutes. In July the 'Arctic' belonging to the same line, made the passage in 9 days 17 hours 12 minutes. It is more than forty years ago. In forty years we have reduced the steaming time of those old ships by some days. Considering, however, the enormous horse-power that is now employed, the prodigious experiences (gotten from those early strugglers, and their immediate successors) embodied in the magnificent structures of to-day, it is not evident that we have a right to triumph very greatly over those passages of less than ten days.

The Collins line perished not alone by British competition, but also by the perils of the deep. The loss of the 'Arctic' in 1854, through a collision with the French steamer 'Vesta,' was followed by the mysterious disappearance in 1856 of the 'Pacific.' She, like the 'President,' left no hint behind her of her fate. The Collins Company, however, in spite of the fine fleet which by this time the Cunard Company had built and launched, continued to run their ships down to 1858, but at ruinous loss, and the honourable, unfortunate, spirited undertaking then collapsed.

It is by contrast that advance is illustrated. This is particularly true of the ship. Only a very faint idea of a vessel can be conveyed in words. I speak of her extraordinary sheer

aft, her foremast stepped in the fore peak, her mizzen-mast stepped in the lazarette, her scantling of prodigious thickness, and so on; and what impression is it possible for me to convey? It is the artist alone who can tell to the unprofessional eye the story of the progress of the ship. I recently attempted to describe the 'Washington': let my poor word-picture of her stand side by side with this charming sketch of a Cape mail steamer leaving Madeira.

Here seem a mould and form of hull which you might think the builders would find it hard to go beyond. Do I mean in beauty? Certainly not. This shape of vessel is a mere wedge, albeit the Cape steamers, I understand, are built with a little more beam in proportion to their length than other mail boats, not with the idea of heightening the comfort of men and women, but to suit the requirements of berthing in the Cape docks. But, taking the iron hull as something to be driven at varying speeds through calms and through storms, quitting port with the punctuality of the railway, one might admit that no better shape could be given to that same iron hull than that we find in this picture of a Cape steamer. Beauty is the very last feature to be considered. The first of the 'tramps' undertook to tow *that* divinity out to sea; it did so, and drowned her, and she lies a corpse under countless gliding iron keels. Build so that your boat shall want to fly into the air, to the strain of her mighty engines grinding in her heart with hollow clangour of song, as though the demon of steam never could shake his iron ribs enough when he thought of the days of tacks and sheets, and how captains swore when a head wind came. So to build involves considerations which neglect all thought of the eye. The eye, if it wants to be gratified, must go below: there it will find the electric light; rich, immovable furniture, glowing mirrors, and skylight domes filled with heavenly



A UNION LINER

flowers. You knock nowadays on the door of a ship for beauty, and when you are let in you find it, if you are a lover of upholstery. One, of course, admits the necessity of the wedge shape, the straight stem, the wall side, and other details which do not belong to the past. Yet, though it is a good thing to be able to reach Cape Town in a little more than a fortnight, and though it is a still better thing to be able to reach New York or Liverpool across the Atlantic in five days something hours something minutes and one second, you cannot, if you are a sailor, or a landsman who has travelled in sailing ships of old and observed—you cannot, I say, but grieve a little when you think of the shapes of beauty which have gone beyond the horizon to their graves, and haunt the ocean only as phantoms to the contemplative mind. Nothing that is beautiful with wings is left to us but the yacht. The iron sailing ship need not thrust herself in. They show you the 'France'—she was, a little while ago, the biggest sailing ship in the world (1894); they may have launched a huger one since—they expect admiration whilst you gaze; you cannot admire, you cannot but mourn. She is ugly enough, with her forest of spar, when everything is furled, and all her gear is hauled taut and the yards are squared by lift and brace—which is a rare manœuvre aboard a merchantman in this age; but when they have sheeted home and manned the halliards,—my precious eyes! as the great Mr. Dicky Suet, an actor of the last century, used to say, —clews a fathom from the yard-arms; here a top-gallantsail arching into sheer monstrosity through cruel deprivation of quite necessary midship cloths; there a topsail hanging like an ill-fitting coat upon a man; yonder a flying jib that, being set by mistake, should have the captain's initials in its corner; elsewhere and *elsewhere*—all is blue sky or driving gloom beheld through labour-saving interstices.

It is impossible to admire the typical iron sailing-ship; and that gives me the very best excuse in the world to own that, if ever I should again go to sea as a passenger, I certainly would not choose a craft that depended on nothing but her canvas.

## VIII.

I HAVE abstained from dealing in these papers with the growth and progress of the ironclad ship of war. The literature of this ship would fill her hold, and to name her is to excite a hundred conflicting emotions and passions. The subject is much too vast for the humble pen of a merchant seafarer. Those who might wish to hear briefly the story of the ironclad should turn to 'The British Fleet,' by Commander Robinson, R. N. This work is a valuable epitome, and it is all about the Navy. Lord Brassey, an original writer and a modest and fearless navigator, has dealt and, aided by the useful nautical expert, continues to deal at large with the ironclad. It is difficult to follow with interest a growth in which organic and radical changes are constantly occurring. No man knows for certain, unless it be the naval constructor, on what lines the ship of war of twelve months or two years hence is to be built. The nation is in the hands of the naval constructor, call him Sir Robert Seppings, or Sir William Symonds, or Sir E. J. Reed, or Sir W. H. White. He is usually a genius and a person of admirable parts as a theorist; but it seems to me, as surely it must have struck many others, that when he goes to work to construct a new ship of war, the very last feature that troubles him is her seaworthiness. That she will roll fifty degrees in a gale of wind; that she will slaughter her sailors by driving them helpless down one furious incline, then down the other; that her office who are sailors will be thinking of their prayers whilst

they watch her behaviour, which might be that of a drowning camel: these are features of the building of the ship which appear to stand last with the naval constructor in the catalogue of things to be avoided. A man, when he designs a ship, should, at least, first of all provide that she shall float when launched; next, that she shall be able to keep the sea in heavy weather; next, that her behaviour in tempestuous times shall be seaworthy enough to leave officers and men in full possession of their senses, whether for the ship which they are handling or for the foe they may be fighting. Robinson Crusoe in hacking out his first canoe overlooked the little subsequent business of launching her.

It would seem that as the ironclad departs from the original ship-form, such as the artist has sketched, she grows more and more dangerous to the people in her, because the naval constructor never seems to provide that she shall be accountable for her behaviour in stormy weather. He sends something to sea, and Jack, half-stifled, is under water in it. A turret is visible awash: frightful pieces of ordnance point long and leanly to the sky; add a pole mast and a military top, and call the whole a man-of-war. The theory of the naval constructor moves at a costly figure in this extraordinary departure. He would secure the sailor's life against the shot of the enemy by clapping him up in a ship which threatens at every lurch in a moderate sea to go to the bottom. It is the same case as that of the Irish sentry, who, seeing another in the act of cutting his throat, shot him to save his life. The old sailors fought in rolling seas. It may be supposed that the sailors of our own age will have to do the same thing. How will they manage? The Bluejacket's case is quite straightforward and intelligible. 'Give us a *ship*; give us something which will look like a ship: give us something in which we can

fight an enemy, even if it were blowing a treble-reefed topsail breeze. Plan therefore, first of all, with an eye to a greater enemy than any this country is likely to find in foreign nations—

THE FIRST BRITISH IRONCLAD, H. M. S. 'WARRIOR'

I mean the sea,' says Navy Jack; 'plan first for the sea! then belt and double belt and make all shell-proof as you are now trying to do.'

It must be said that the earlier steamships were built with a clear conception of the dangers of the sea. The 'Forth' and the 'Amazon,' both belonging to the same company, the Royal Mail, were tall, handsome, wooden ships, sitting very lofty upon the water, and rigged proportionately to their bulk. The 'Forth' was 1,900 tons gross, or 1,147 tons register, and 450 nominal horse-power. The company to which these ships belonged was subsidised to the amount of nearly 85,000*l.* a year by the British Government, who desired the creation of a class of merchant steamer which could be of use in war time. No money was spared in the construction of the ships of the Royal Mail. Forms which seemed the handsomest afloat to the eyes of that generation were chosen; they were engined by the best makers, they were richly furnished within, and without they looked as imposing as men-of-war.

Extraordinary ill-luck, however, attended the early ships of this company. In a few years they lost, by shipwreck, the 'Isis,' 'Tweed,' 'Solway,' 'Forth,' 'Actæon,' and 'Medina.' But the most memorable of these disasters was to follow. I am looking at a picture of the 'Amazon,' and cannot imagine that any hull could possess more grace on the basis of so much beam, disfigured as she is, moreover, by the over-hanging penthouses of the paddle-boxes. She was 300 feet long, 41 feet wide, and 32 feet deep, and her gross burden was 3,000 tons. This noble ship was built by the Greens at Blackwall, and was launched in June 1851. She went round to Southampton in command of Captain Symons, and sailed early in January for the West Indies, with fifty passengers and over one hundred of a crew. When in the Bay of Biscay, fire broke out; the

'Amazon' was a wooden ship; the appliances for subduing fire were crude; they passed buckets along, until the leap of the red flame drove the unhappy people forward or aft, and so the ship was lost. She makes, then, one of the wildest pictures in the maritime annals. They could not stop the engines; it was blowing a gale of wind, and the ungovernable vessel rushed over the midnight sea, lighting up the ocean for leagues with the flames which had burst through the gangway in front of the foremost funnel. A great number of people were drowned when the 'Amazon' sank. Whether, if she had been built of iron, her people would have stood a better chance for their lives is doubtful, in spite of the case of the 'Sarah Sands' which ship, though gutted by fire into a shell, was safely conveyed to a port.

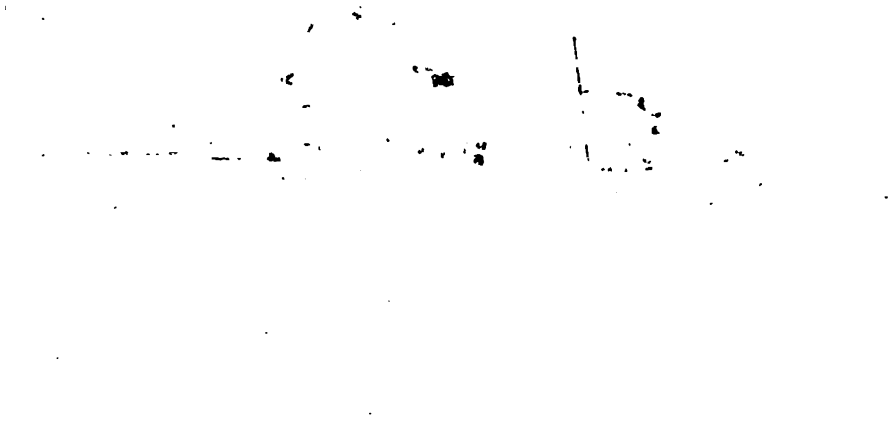
Wood was the obligation imposed upon the company with the Government subsidy. When the State suffered the directors of the Royal Mail to build as they pleased (by this time growing a little doubtful whether wood was preferable to iron for purposes of war) the company addressed themselves to iron, and discarded the paddle-wheel for the propeller; and from that day down to this, the ships of the Royal Mail, though comparatively small, undoubtedly float first amongst the beauties of the sea.

Two very fine ships are the 'Norman' and the 'Scot,' both belonging to the Union Steamship Company.[1] They are designed for the South African trade, a hot trade when once the Bay is cleared; but all that can cool perspiring humanity, all that may delight the eye in the shape of sumptuous equipment, combine in these ships. They are graceful structures. They sit with that sort of airy buoyancy which suggests the traffic of the tropics. A trip to the Cape will probably prove

[1] 1894

some of these days the most popular of all voyages. The ships are staunch, splendid, and swift; the journey is not tediously long; the sea-sweetened climates through which the passenger is carried are full of health and life, and the heavens are glorious by night and full of stars. You behold the Southern Cross and witness many spacious and magnificent sunsets, and also the lunar-dawn, which is the tenderest revelation of the deep.

Nothing is more interesting than the first ships of great



THE 'CALAIS-DOUVRES' IN A CHANNEL FOG

companies—companies whose fleets are now calculated in hundreds of thousands of tons, whose ships are like ironclads, whose commanders and officers twinkle on the bridge or quarter-deck in gilt and lace and buttons, just as though they were lieutenants and commanders in the Royal Navy. I believe, but I will not state positively, that the earliest steamer owned by the Peninsular and Oriental Steamship Company was the 'Royal Tar.' She was the first of the line of steamers

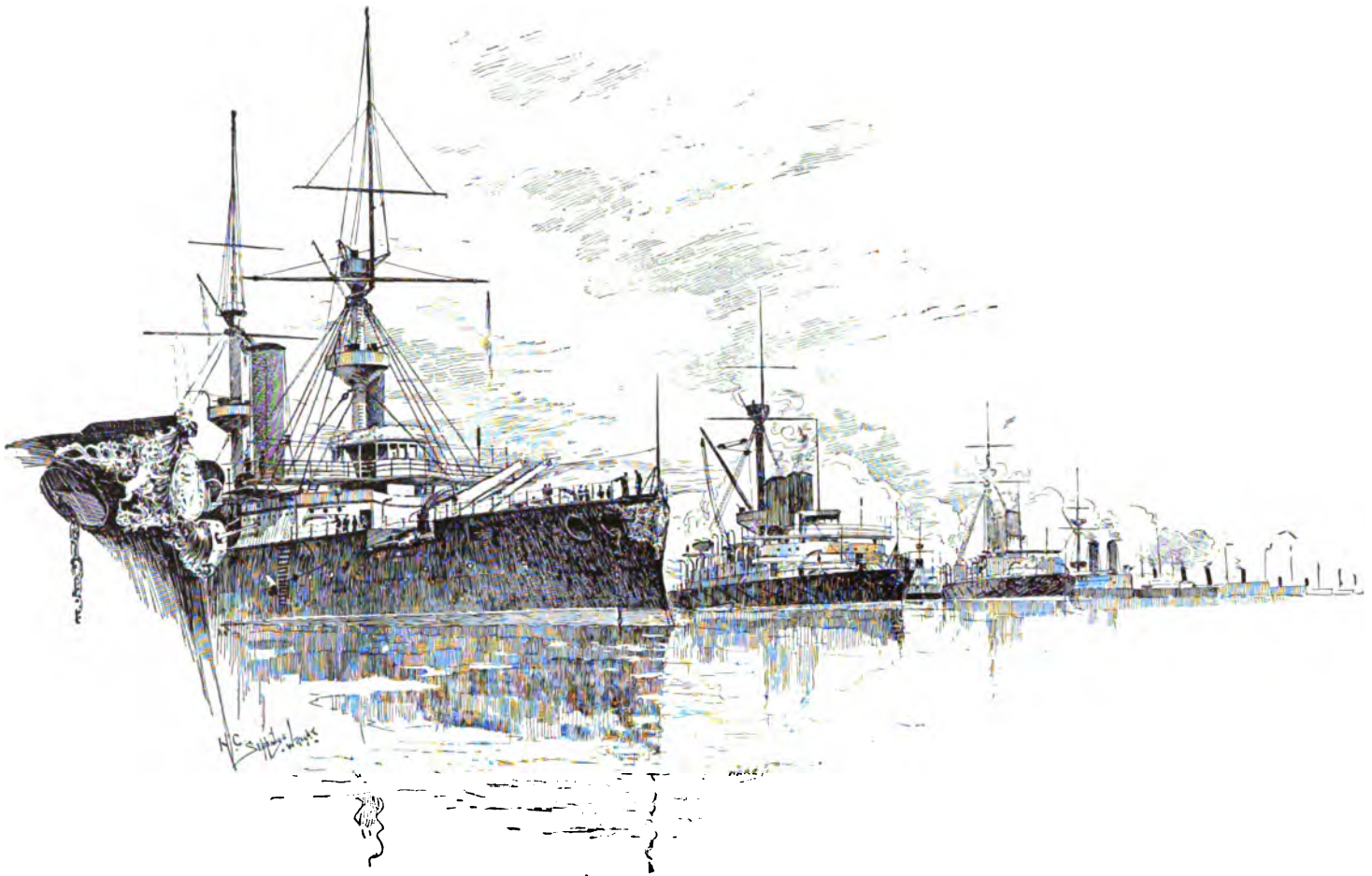
which ran about 1837 between London and the Peninsula. They were doubtless glad on both sides of the water to get the punctuality of steam. Prior to the existence of the Peninsular Company the mails were despatched by sailing vessels from Falmouth to Lisbon once a week. As wind and weather did not always 'permit,' the mail-bags were occasionally a month overdue.

The 'Royal Tar' was not unlike the earlier steamers of the General Steam Navigation Company, such as the 'City of Paris,' the 'City of Boulogne,' the 'Rhine,' and others whose names I cannot now recall. She probably was a tough, well-built boat, with paddle-boxes far forward, and such a sheer of bow as makes her seem sagged. As the full-rigged ship is to the coracle, so, we may say, are the beautiful giantesses of the P. & O. Company to the 'Royal Tar.' Certainly that early mother, staggering with high funnel over the uncomfortable seas of the Chops, would have a right to feel proud of her issue. So of the magnificent steamships of the Cunard Line. The 'Britannia' may be compared to the 'Royal Tar' in many points of primitive equipment, if not in burthen, rig, and general appearance—I mean that 'Britannia' of the Cunard Line which carried Dickens to Halifax and Boston in 1842. Behold her progeny! I know not why the nation should not take as much pride and interest in the noble commercial steamships which sail out of the Thames and the Mersey as it does, or professes to do in the vessels of the State. We see these magnificent steamers passing, we admire them hugely, we know what their speed will be when they fairly get to sea; and I say that as a maritime people we ought not only to feel proud that such fabrics are possessed in this country, but that we have builders such as Harland & Wolff, Wigham, Richardson & Co., J. & G. Thompson, Hawthorn, Leslie & Co., and many others, able to construct them.

The ship-yard of to-day is a sight, in times of activity, to stir the blood of the most sluggish. The enormous fabric, ready for launching, towers on high. The workmen, who have built her of steel plates and angle-irons and glowing rivets, are pigmies on her decks and dwarfs under her bends. The ear-shattering clash of hundreds of hammers striking countless pieces of metal sweeps ceaselessly from river's side to river's side. The buzzer lifts up its iron throat and delivers its hideous summons; the air is white with steam and black with clowds of smoke; and out of all this turmoil, this sooty scene of the toil of thousands, many hidden, many visible, glides some last magnificent steamship of ten thousand tons, by and by to float away towards the American seaboard or the distant Southern Ocean: a sumptuous ship, full of drawing-rooms and boudoirs, and an engine-room of machinery exquisite in finish, singing softly its song of the yard, but ceaselessly thrusting onwards the huge shapely metal length with revolutions of shining rods and shafts of the sureness and strength of any force of nature.

Notice should be taken of the efforts which have from time to time been made by the marine architect to mitigate the miseries of sea-sickness. He has doubled his ship, and he has slung his ship as in a cradle. To no purpose. The life of the Channel steward remains an arduous one. Sea-sickness is not to be conquered by the shipwright. If it was merely the rolling motion that creates nausea, then a hammock or a cot would be as sure a relief as a twin ship or a cradle-hung saloon. Sickness is caused by the several motions of the sea combined; and the worst of these movements the builder cannot possibly deal with—I mean the trough into which the ship falls, and the liquid acclivity to whose frothing head she leaps.

It is not strange to find that the twin ship was anticipated



BRITAIN'S FIRST LINE OF DEFENCE

as an idea so long back as 1663. She was built by Sir William Petty, a man of genius, of great inventive powers, who, when he was only fifteen years of age, had mastered the Latin, Greek, and French tongues, 'the whole body of common arithmetic, the practical geometry and astronomy conducing to navigation, dialling, etc., with the knowledge of several mechanical and mathematical trades.' So says old Anthony à Wood. This learned and ingenious man made an experiment in ships. Dr. Sprat, in his 'History of the Royal Society,' declares that 'it was the most considerable experiment that has been made in this age of experiments.' Dr. Sprat rejoiced rather too heartily. Petty's double ship was by no means a success. It is claimed for her that she was very quick in stays, and her double bottom caused her to sit very stiff. She was lost in a gale of wind. Petty does not appear to have been disheartened. He devoted many years to musing upon a new model, and finally designed, or actually produced, something which caused Dr. Wood, in a letter to Sir Peter Pett,[1] to say: 'If we consider the strength (in every vessel), the burden, ballast, draught of water, sailing, steering, keeping to wind, and as many more properties of a good ship, his excels the best the world has yet produced'; and he puts Petty's case thus: 'A common single body being given, suppose of seventy tons neat burden, with thirty tons of ballast; we offer to make a double body which needs no ballast—viz., to carry as much sail light as the other loaden, of the same or more neat burthen; but its draught of water shall be as 4 to 7, and the cost as 7 to 11, and shall bear sail as 11 to 7.'

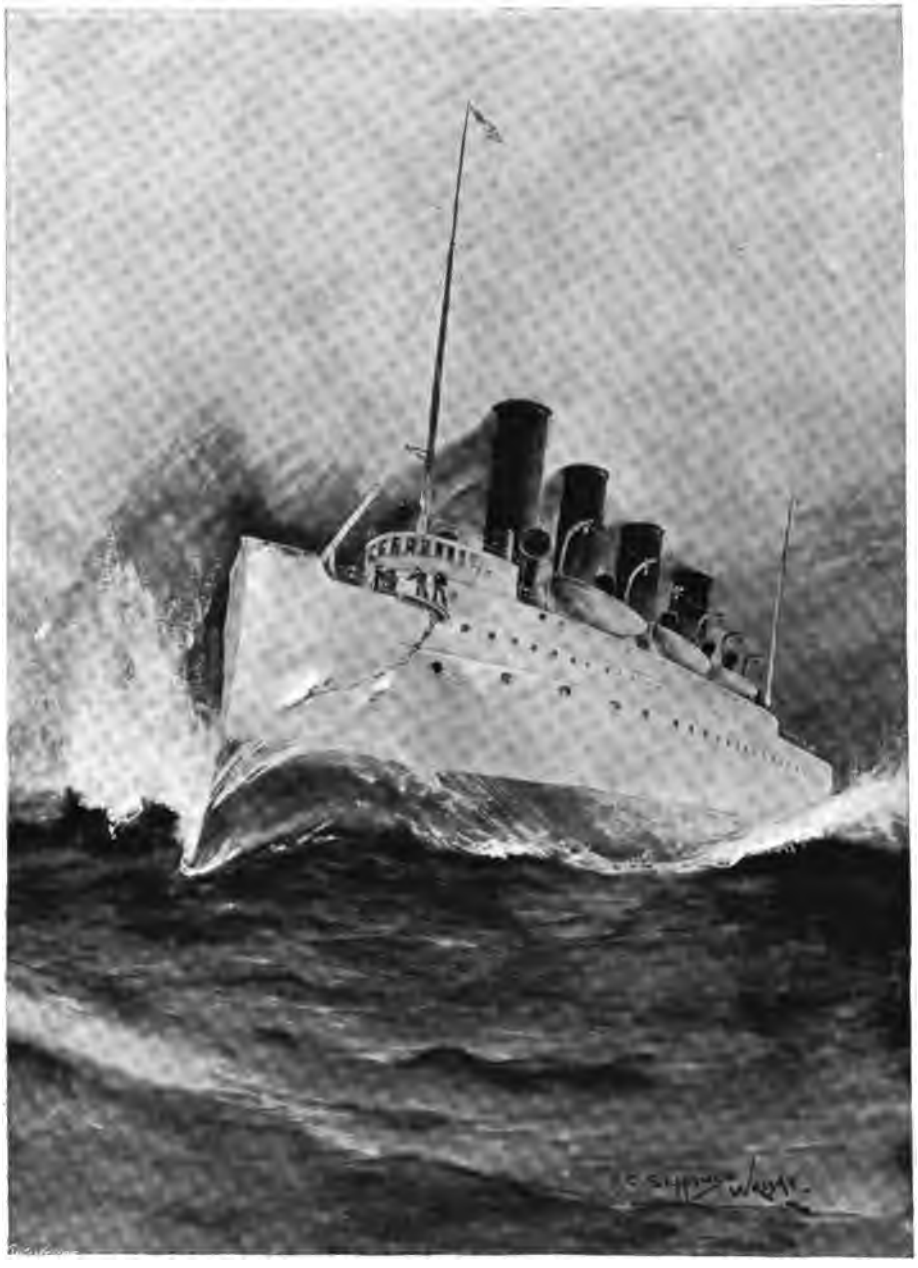
The enthusiasm of the inventor is proverbial. Petty's ship has gone the way of Petty himself, yet in that old double-bottom

[1] Not to be confused with Sir William Petty, who was one of the founders of the Royal Society.

we find a sort of forerunner of the well-known Channel steamer our artist has drawn.

The 'Castalia' should be named here as an experiment in shipbuilding. She was composed of the two halves of a longitudinally divided hull 290 feet long, set 26 feet apart, strongly girded, with cabins enclosed, and a raised deck. The paddles revolved in a water-way between the two hulls. She was designed by Captain Dicey, who founded her upon the outriggers which ply in the harbour of Galle—'long, cranky boats, hollowed out of tree-trunks, and steadied in the water by a log of timber fixed to the end of two wooden outriggers which project some way from the vessel's side.'

The 'Bessemer,' a ship well within living memory, was designed by Mr. (now Sir) E. J. Reed with the humane intention of diminishing the sufferings of the sea-sick. The 'Bessemer' was an iron vessel, built at Hull by Earle's Shipbuilding and Engineering Company: for forty-eight feet from each end she had a freeboard of about three feet only. She was 350 feet long; her shape, like the boat of the whaler, was the same fore and aft. She was fitted with deck-houses for private parties, and refreshment bars. The swinging saloon, however, was the grand feature of this remarkable ship, which, in her picture, in many respects presents the appearance of a turreted ironclad of scarce, perceptible height of side. The saloon was in the centre of the vessel, and was entered by staircases which conducted to a landing held to the saloon by a flexible flooring. The body of the saloon swayed on four steel supports. The ship's speed on trial across the Channel did not show anything in excess of that of the ordinary boats, which were then making the passage in two hours. Mr. Bessemer, after whom this vessel was named, does not appear to have spoken very enthusiastically about her, when at a dinner given to him in Calais he said: 'I never dared to hope that at first this ship would be com-



UNITED STATES CRUISER 'COLUMBIA'

pletely successful, so much depends on skill; and you must remember that there are no means whereby absolute automatic action can be given to the saloon, because there is no absolute point of stability. Within the ship we are like Archimedes, who wanted a fulcrum for the lever that was to move the world: what we want is to place our fulcrum in an absolutely quiet spot. . . . In port the machinery will move with a degree of steadiness that is all that can be desired; the very reverse of this will take place at sea, when the vessel itself moves and the cabin is required to be quiet; and just as we require more practice to move the cabin in still water, so we require more practice to keep the cabin still in the moving ship.'

The 'Bessemer' proved even a greater failure than the 'Castalia.' They were costly experiments, and their bold originators deserved better luck. No doubt the swinging cabin was a little alarming. If anything should give way! Intending passengers must also have reflected that they would go down with this swinging cabin into the yawning gulfs and rise with it to the mountain peaks, and their distress of two hours lay in *that.*

Another curiosity in shipbuilding was the cigar-ship, built at Baltimore in 1858. Her constructors afterwards built a similar vessel on the Thames. She was a huge, tapering iron tube, without bows to resist the seas, without stern to drag the the water, without masts, spars, or rigging to hold the wind. She was 16 feet broad and 180 feet long. The theoretical designer is always governed by very exact ideas as to the qualities of his ship on paper: *there* she is a miracle; *there* she glides with the buoyancy of a gull over billows of Andean altitude; her speed is prodigious; in short, she is going to revolutionise the ship. But, to paraphrase Johnson's observation on gratitude, the ship is a flower of very slow cultivation, be she of wood or be she of steel.

There is proportion, there is power, there is the character of warlike menace—in short, there is the good sense of the combined yards—in the 'Columbia,' the pride of her country. At how many knots is she slashing through it in the artist's delightful picture of her? Her designer had no cigar-ship in his head when he planned her. Alas! the cigar-ship went the way of the 'Castalia' and the 'Bessemer'; she wanted stability. No seaman, indeed, could have endured such a shape; yet the builders were very positive in their hopes. 'No water,' said they, 'can be shipped that will sensibly affect the load or endanger the safety of the vessel, which may, we believe, be propelled at its highest speed in rough weather with impunity —which is far from being attainable by vessels now built to be propelled wholly or in part by sails.'

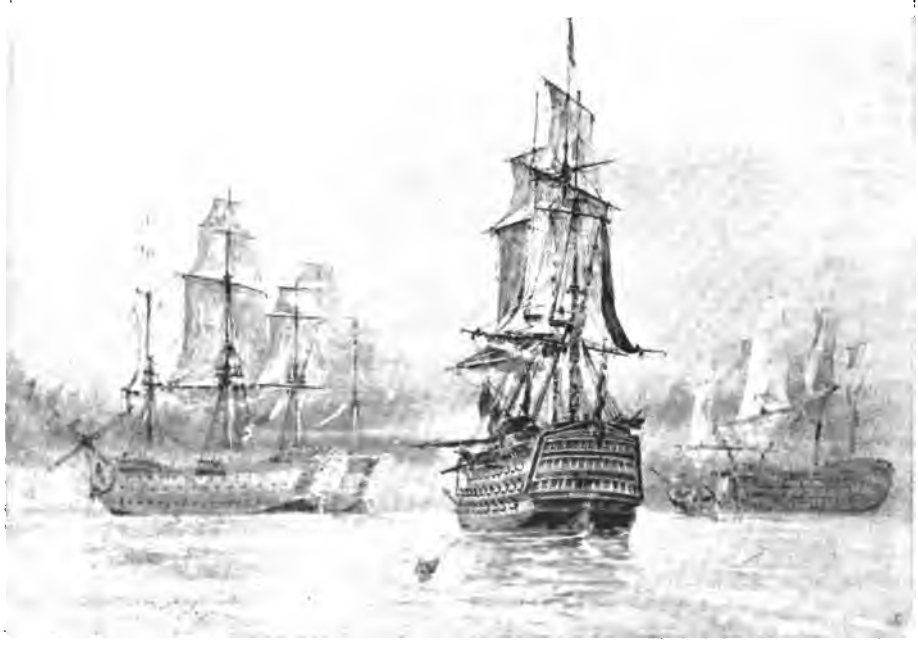
No man need live many years to witness the rise and the decline of a great number of human inventions, particularly marine inventions. I will say nothing of the Channel Tunnel, which is not an invention—though I wish it so well that I would heartily like to see the short scope already bored, plugged, cemented, and effectually stopped by the personal toil of the originators of the scheme. I have lived to see a ship built like a whale, and I have also lived to see her crew step ashore and swear that not pounds a week nor the sternest threats of the magistrate could induce them to return. I have lived to meet a man who, with all spiritual solemnity, contemplated, at his own cost (and that of a few others), the erection of a floating tower or lighthouse in mid-Atlantic whence the keepers of the light could, from the rolling summit, telegraph the state of the weather east and west. I have been spared to behold many queer forms of ships, the most uncouth which do undoubtedly fly the proud cross of St. George, as Dana calls the flag. Whether any human being now drawing breath will live to see the armour-clad man-of-war arrive at

that sort of perfection which was attained by our fleets of wood, who can tell? The ironclad of to-day, although many years of experience already enter into her construction, remains an experiment. She is the 'Comet,' she is the 'Charlotte Dundas,' of the close of the nineteenth century. Nor is it conceivable that a naval war will settle the score of problems which the change from the state of the old 'Victory' to the state of H. M. S. 'Benbow' or H. M. S. 'Trafalgar' submits to the naval constructor and the marine strategist. An ingenious naval expert is of opinion, for example, that the manœuvres of a steam fleet will not differ very materially from the tactics employed by Howe, Duncan, and Nelson. He believes that a line of battleships drawn up in a new moon or crescent, in the order of the Spanish Armada when it sailed in the Channel, in the order of the combined fleets of France and Spain when they lay with their topgallant-sails shivering awaiting the slow approach of the British, will pause for the attack of the enemy; and that enemy must of course, consistently with tradition, be the British. The expert believes that we will cut the line as of yore—that we shall be allowed to cut the line. He quotes Vice-Admiral P. H. Colomb[1] and another. He does not tell us what the lee division of the enemy will do after he has allowed the British to repeat the manœuvre of Nelson.

In truth, the soot from the funnel of the ironclad has blackened the atmosphere. We see very imperfectly. Grotesque shapes float by. We strain our sight at the naval constructor's last embodiment. We hope for the best; but few men in their senses can suppose that the ships which are to bear the national flag of our country in the next century will in the

[1] An officer to whom every student of naval literature must be grateful. And the thanks of the student are equally due to Professor J. K. Laughton.

least degree resemble those experimental arks of horror and menace (to those cooped up in them) which in these times roll off shore as they wash along their way to their stations. The eye turns for solace to the 'Victory,' as she lies at rest. The peace of the grave is hers. They may go on re-doctoring her till there remains not an inch of the timber which resounded Nelson's cannon, whose echoes of thunder fetched a sigh of pain from the lips of the dying chieftain. Yet, let them continue rebuilding her for ever; for what can transcend her as a memory, an impulse, an influence? The hearts-of-oak of to-day are worthy of their sires; and all must wish that, like their sires, they may be permitted to fight the battle of their country in ships they can grow attached to, in ships which will look ships and behave as ships, in ships which shall prove an anxiety to the enemy only.



'THIS SHIP THE "VICTORY" NAMED'

# SUPPLEMENTARY NOTE

THERE must happen before long one greater revolution in the story of the ship than we have yet witnessed. The ship of war is no longer a ship, but a machine, and a machine that is rendered more complex every year. This complexity of machinery demands an application of intellect which must be sought for in vain in the Nelson traditions. No man who loves the full-rigged ship as I do can deplore more greatly, in the name of memory, heroism, and beauty, the extinction of those tall and glorious fabrics which flew the flags of our great admirals. But though our love is with the past, our expectations must repose upon the future; and that future inexorably means this—that the machine will be handed over to the machinist, and that the Royal Naval Engineers will take up the tale of the quarter-deck, and perpetuate the traditions of the Mistress of the Seas as our fighting Engineers. Ere long the canvas of H. M. S. 'Britannia' will be seen flickering in the ocean recess, hanging star-like, remote, then vanishing for ever. The country will not need men supplied by this sort of training ship. It will want engineers for the engine-room, and engineers for the bridge and its tactics, and engineers for the guns. And if the Bluejacket is present he will be required in small force only. And if the Marine is perpetuated it will be out

of love of tradition, because, depend upon it, the fighting stokers, and the people who have to work all other parts of that great complex machine, the man-of-war, will suffice. I close this note with a sigh, for I love the past, and find nothing to interest me in the giantess of 16,000 tons displacement.

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